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FIRST LINES OF THERAPEUTICS

AS BASED ON

THE MODES AND THE PROCESSES OF HEALING,
AS OCCURRING SPONTANEOUSLY IN DISEASE;

AND ON

THE MODES AND THE PROCESSES OF DYING,
AS RESULTING NATURALLY FROM DISEASE.

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IN A SERIES OF LECTURES.

BY

ALEXANDER HARVEY, M.A., M.D. (EDIN.)

EMERITUS PROFESSOR OF MATERIA MEDICA IN THE UNIVERSITY OF ABERDEEN,
FORMERLY LECTURER THEREIN—SOME TIME ON THE INSTITUTES,
AFTERWARDS ON THE PRACTICE OF MEDICINE; CONSULTING
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HARVEIAN SOCIETY OF EDINBURGH,
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Sir Thomas Watson, Bart., author of the well-known *Principles and Practice of Physic*, kindly allows Professor Harvey to append to his First Lines of Therapeutics the following remarks on that work as contained in a letter to him, dated May 16th, 1879.

"You have thoroughly thrashed out the great theme which you proposed to discuss. It is certain that a sound system of Therapeutics must rest on a consideration of what Nature in many cases is capable, and in some fewer cases, is incapable of doing in Disease: and, on the other hand, on what Art may do in helping or hindering Nature. All this, I say, you have most fully explained; and I feel sure that the student of your volume cannot fail to have his mind cleared up and settled on these most important subjects . . . . . . I see nothing in it which I could wish were otherwise . . . . I am entirely in accord with you as to the *Vis Medicatrix Naturæ*, which some of the present day decry and denounce."

TO THE MEMORY

OF

WILLIAM PULTENEY ALISON,

M.D., D.C.L., V.P.R.S.E.,

PROFESSOR OF MEDICINE IN THE UNIVERSITY OF EDINBURGH,

FIRST PHYSICIAN TO HER MAJESTY IN SCOTLAND,

ETC., ETC., ETC.

OF

SIR JOHN FORBES,

M.D., D.C.L., F.R.S.,

PHYSICIAN TO THE QUEEN'S HOUSEHOLD,

ETC., ETC., ETC.

AND OF

ADOLPHE GUBLER,

M.D.,

PROFESSOR OF THERAPEUTICS IN THE ECOLE DE MEDICINE,

MEMBER OF THE IMPERIAL ACADEMY OF MEDICINE OF FRANCE,

ETC., ETC., ETC.

THESE FIRST LINES OF THERAPEUTICS

INTENDED TO REFLECT THEIR TEACHING

ARE INSCRIBED.

PREFACE.

THESE Lectures—designated FIRST LINES OF THERAPEUTICS, are submitted to the Profession, and particularly the younger members of it, in illustration, on the one hand, of the Workings of the *Vis Medicatrix Naturæ*,—or of the Modes and the Processes of Healing and Recovery, as occurring spontaneously in Disease,—and, on the other, of the Modes and the Processes of Dying, as resulting naturally from Disease,—or of the Modes of Fatal Termination of Diseases.

These two great subjects obviously underlie the whole science of Therapeutics; and to the virtual neglect of all instruction in them in the Courses of Materia Medica in our medical schools, and of all allusion to them in our treatises on that branch,—and, further, to the teaching of Therapeutics generally, in almost all our schools, at a stage of the curriculum when it is sheer folly to attempt to teach it, the Author is disposed to ascribe much of the misconception that prevails in the profession in regard to the relations subsisting between Nature and Art in the cure of disease,—and, also, as arising out of that misconception, the aspersions cast by not a few on the actual state of the science of Therapeutics.

Instruction in the inherent tendencies of diseases to a favourable termination and in the curative powers and provisions of the living organism, may truly be said to constitute the first great *lesson* in that science,—one essential to a right knowledge and the due appreciation of the powers and the resources of Art—the articles of the Materia Medica included. And yet where is that lesson taught? In which of the books that treat of Materia Medica and Therapeutics is it to be found? In truth, this whole subject is so expounded as to leave the young student to infer that the cure of disease is exclusively effected by the agency of the Drugs,—the actions and the uses of which are set before him. Virtually it is so—exceptions here and there duly allowed for. Again: Instruction in the fatal tendencies and in the modes of fatal termination of diseases, may be said to constitute the *second* great lesson. The relations of this subject to the general science of Therapeutics are sufficiently obvious. In many cases the warding off of a fatal issue is the most important object we can propose to ourselves in the treatment of disease; and it belongs to Therapeutics to find the ways and the means thereto. And if the relations of the subject to the Materia Medica be indirect only, they are nevertheless all-important. For without a sound knowledge of the several modes of dying and of the physiology of the Dying processes, it is impossible to have a right understanding of the physiological actions of a large number of the articles it comprises, and especially of the most powerful and in many respects the most valuable of these. Nor would it be difficult to point out sundry serious errors in the books, arising, presumably, from an imperfect acquaintance with this department of physiology.

The main purpose of the Author in this work is, to call attention to these two important but much neglected subjects, as they stand related to the science of Therapeutics and the study of the Materia Medica.

In connection with both these subjects, and particularly the former of them,—and in order to strengthen the main positions taken up by him throughout, he has deemed it expedient to treat, preliminarily, of some matters bearing on them, or leading up to them. Among others, he has been led to consider the views that have obtained as well popularly as in the schools in regard to the *nature* of the curative powers of the organism,—and also the proper sphere and the real power of Art, generally, in the cure of disease. And as Cure bespeaks Disease,—and Recovery, Health, he has been induced to consider what Disease is, and what its relation to Health.

The Author would fain hope that this attempt to unfold subjects so large and so important,—and in respect of which the information at his command is in a great measure fragmentary and dispersed through different books, will receive a candid consideration at the hands of the profession. His desire is that it should look on these Lectures simply as "*Memoires pour servir*,"—as jottings which may lead others more competent than himself to work in this precious field, and give us, as the fruit of their labours, a complete system of Therapeutics reared on the lines here indicated,—and embracing as well the science of *Natural* Therapeutics as the science of *Applied* Therapeutics or the Therapeutics of Art.

It will be found in these Lectures that the Author is often repeating himself,—reiterating again and again the same views, and making use often of the same illustrations. So far, it is of set purpose that he does so. The entire subject, while in his view of the highest importance, is, to a great extent, new to the younger students of Medicine, whose interests he has chiefly in his eye. To such, one statement of an important truth is not enough. It needs often to be told them again and again, and presented to them in all its manifold aspects. Mr. Ruskin has given forcible expression to this need; and so has the late Mr. Campbell de Morgan, and so have many others. The Author, however, has striven as far as in him lay to avoid overdoing this. Whether he has succeeded to the extent his readers would desire, it is for them to judge. In as far as he has failed in this respect, he can only now throw himself on their indulgence and kind forbearance.

One thing he fears he must lay his account with. It is this—that he will be looked upon by some, as Sir John Forbes was, as a Therapeutic *Nihilist*. To this charge he avers he is not open. And he would urge that it is exceedingly difficult for one to take up a certain position strongly without laying himself open to the charge of exclusiveness, or of under-rating the opposite position. He is himself satisfied that in his treatment of the whole subject, he has placed Nature and Art on their true footing; and that while asserting the supremacy of Nature over Art, he has yet given Art her due.

UNIVERSITY OF ABERDEEN,
April 30, 1879.

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LECTURE FIRST.

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1. We read from time to time in medical books, or we hear it said in familiar professional converse, that Therapeutics, in its scientific relations especially, is in an unsatisfactory state,—in a most unsatisfactory state: nay, worse still, this great subject is said to be in utter confusion,—to be in a disgraceful condition. It is said of it that its condition is a shame and a reproach to us; and as to medical practice generally it is said that there

are no fixed principles of treatment, that opinions are antagonistic and conflicting, bewildering the student and rendering the profession the butt of ridicule. It is the homœopaths particularly that thus speak of this science,—and seemingly with glee. Yet it is not the homœopaths only that do so. Sir Thomas Watson and others in the orthodox ranks of the profession have spoken of it, and of our art generally, in terms scarcely if at all less damnatory. Sir Thomas on one occasion spoke of much of our practice being random and hap-hazard, and as such discreditable to medicine as a science, and of the profession as continually fluctuating on a sea of doubts about questions of the gravest importance; adding also that this uncertainty—this unseemly variation and instability of opinion is a standing reproach to the calling we profess. And he concluded by observing that it has driven many men—both able and thoughtful men—to ask themselves whether any kind of medication other than the *Vis Medicatrix Naturæ* is of any real efficacy or avail in the cure of disease. Sir Thomas, if he did not qualify these remarks, which I quote at second-hand from a homœopathic pamphlet, spoke at the time, no doubt, from a special point of view then in his eye. Yet, in my opinion, there is a good deal of truth in what he said. Allegations, moreover, of a like kind might be largely quoted, even from others than Molière and the homœopaths. But let those just now adduced suffice.

2. Much as in all its *other* departments medical science has advanced during the century now current, the science of Therapeutics, it is alleged, has made but

little progress. During that period, indeed, we have had large additions made to our curative resources,—resources of the highest value, and admitting of important practical applications. Yet, as regards the vast aggregate of the weapons of our warfare with death, disease, and suffering,—of such as have a place in the National Pharmacopœia, what is remarkable is, how little we really know of the *rationale* of their action on the living body, or of the whole conditions of their action. If you will compare our text-books on Materia Medica one with another, you will not fail to be struck with the widely different statements presented in them, both as to the facts ascertained (or assumed to be ascertained) regarding their action on the living organism and as to the physiological explanation of their action, and this especially as regards the more important of them; while with respect to the application of these remedial agents in the treatment of disease, you will meet with very conflicting statements.

3. The charges I have adduced, and the admissions I have now made form a very heavy indictment on our science of Therapeutics, and on all concerned in the teaching of it. But the indictment is not thus restricted. It is levelled against the whole body of the profession. It is the profession generally that is charged with having no fixed principles of treatment; it is of the profession generally that it is said that its opinions as to the treatment of disease are antagonistic and conflicting. In short, it is charged against us all that our whole system of practice as well as our whole science of therapeutics, is in utter confusion, and as such a

reproach to us, discreditable, shameful to us as a profession.

4. It is this grave charge, that I propose bringing under your notice to-day. And I trust we shall find that making due allowance for blame-worthiness, there is no fair warrant for an indictment so sweeping.

5. That our science of Therapeutics, the science of the great art of healing is in an *unsatisfactory* state, I readily allow, nay, I allow that it is in a *most* unsatisfactory state, in a state that is in the *highest* degree unsatisfactory. Stronger adjectives I cannot find in the dictionary. But bear in mind what I say, *unsatisfactory.*

6. Whether, however, this state of the science is one that is *discreditable* to us—a reproach to us—as a profession, as our therapeutic malcontents affirm, is a widely different question. And the two things should be carefully distinguished. We have made prodigious progress during the present century in a branch which we may fairly claim as all our own. I refer to Chemistry. And all that chemistry has done for mankind (and it is incalculably great) we may credit to our profession as the special cultivators of it. But as chemists we have as yet failed absolutely in one particular,—one which was much in the eye of our predecessors—the alchemists. We have not yet succeeded in converting the baser metals into gold. We have not yet succeeded in discovering the philosopher's stone wherewith that conversion was to be made. Is this failure a reproach to us—discreditable to the chemical members of our body? So it may be with us in the matter of thera-

peutics. This science may be in an unsatisfactory state. But that it is not in the state we should all desiderate, may be no fault of ours. It may be due to the *nature* of things,—to circumstances beyond our control. Seeing what we have done as a profession during this century,—nay, within even the last fifty years, in every *other* department of our vast science, save and except this one branch—the science of therapeutics, there is surely an *à priori* presumption that the low estate of therapeutics is referable to causes that are in a great measure beyond us and above us. Why *should* the men that have achieved so much in other fields have failed so egregiously in this field,—in one sense the most important of all, because directly underlying the main object of the professional life, namely, the cure of disease, and, moreover, the most assiduously and the most widely cultivated of all? Why should they unless it be from causes that transcend their powers? We cannot do the things that we cannot do!

7. I do not mean to affirm that we are not to a certain extent blameworthy in this matter. But I affirm confidently that the actual state of therapeutics is in no such sense as our malcontents imagine a reproach to us. Our blameworthiness lies in a different direction from what they suppose. The truth is, in my opinion at least, that we have not yet, as a profession, given up the bootless attempt of discovering a philosopher's stone in therapeutics,—a stone wherewith to cure radically, directly or in a positive sense all manner of diseases,—to cure them infallibly and at once, as by a charm, with this drug or that. As chemists, indeed,

we have long since abandoned that airy dream of our forefathers—the alchemists. As therapeutists, however, we still as a body—or vast numbers of us do, continue to cherish the delusive notion of finding in drugs what drugs never will—never can yield us. And it is this notion, still entertained by too many among us, that has bred not a few of the errors and misconceptions that abound in the field of therapeutics. Blameworthy we are in this. But our traducers are so still more:—they especially entertain that notion,—and above all the homœopaths,—otherwise these would not talk as they do of their *one* great law of "*Similars.*" One would suppose, indeed, from the way they speak, that the homœopaths believe that they have discovered the stone in question, and having done so that they are free to heap abuse on the system of therapeutics they have abandoned.

8. Blameworthy we are too in this other respect, namely, that almost nowhere in the United Kingdom, is therapeutics taught in a way that can be called real or genuine. Almost everywhere it is taught to first or to second years' students. To such students it is as beating the air,—it is throwing words away to teach it. Such students cannot take in even the elements of it, because of their being as yet profoundly ignorant of physiology and pathology. It is well remarked by Dr. Flint, one of the most eminent of living American physicians, that the knowledge of the *Natural History* of diseases is the true *point of departure* for Therapeutics. More than this, or in addition to this, Dr. Flint says also, that it is that part of this history that relates to

the *terminations* of diseases,—their natural *issues* whether in recovery or in death, that is the real point of departure. This affirmation is, I hold, a cardinal one in therapeutics. Would that it were well weighed and acted upon by those whom it concerns! In the fine old Course of Institutes of Medicine, such as it was conducted in bygone days in the University of Edinburgh, physiology, pathology, and therapeutics were taught, and in the order just indicated. Observe the order, and note the place of therapeutics. Anatomy of course premised, physiology stands first, pathology next, therapeutics third and last. This tallies with Dr. Flint's dictum; and it is as it should be. But these many years past, both pathology and therapeutics have vanished from the Course of Institutes; and now, putting the cart before the horse, we teach the most complex if not also the most difficult of all the three to first years' students,—to students as yet ignorant, as I have said, of physiology and pathology. As well teach the higher mathematics to mere children! As well teach pathology and practice of medicine to students of that standing. Such a scheme would have at least the merit of *congruity*. To shew you that I am not speaking unadvisedly, I may mention that a few years ago almost the whole body of lecturers on materia medica and therapeutics in the London Medical Schools, presented a Memorial-Letter to the General Medical Council, setting forth the hardship of their position in having to teach therapeutics (the only thing they really have to teach or can well teach in the way of lectures) to first years' students. The materia medica, indeed (a stereotyped subject) such students may learn—but not therapeutics.

9. Surely, if any branch of medicine more than another needs special systematic instruction, it is therapeutics. The branch that is of all others in the position I have indicated,—unsatisfactory avowedly,—and that is said by some to be in a state that is disgraceful to us as a profession, must, one would think, be in some way one of the most difficult for students to acquire, and therefore one that most demands special training in it. Yet, as I have said, it is taught nowhere or almost nowhere,—to any good purpose. And to this must be ascribed, in part at least, the condition in which it stands.

10. But have we not systematic treatises on therapeutics which students of riper years may read and study of themselves? We have. Does not then my contention as to this matter—does not the solution I have offered of the unsatisfactory state of this science in a great measure, if not wholly, fall to the ground? I am ready to admit that it does—so far. Still I feel warranted in regarding the teaching of it to students of the first year, or even of the second as a standing folly and a crying evil; and I cannot but think that were it made, as it ought to be, an advanced branch of the curriculum, it would rise in the regards of the teachers of it and receive at their hands the attention its great importance demands. The books we have on therapeutics are not, however, (as I will presently shew [illegible] as are fitted to supply the needs of students. [illegible] of [illegible] atives, emetics, diuretics, tonics,

narcotics, &c. And they treat also of the actions and uses of individual drugs.

11. But information on these points is not all that is needed. It forms in fact but a small part of what is really needed. And this brings me to what is the backbone of this Lecture,—and of this whole series of Lectures. There is a branch of therapeutics that is not so much as referred to in any of our treatises on therapeutics, or brought into view by teachers in the class-room—otherwise than *incidentally* in as far as it is brought into view at all.—One of the most recent of our writer on Therapeutics, and one of the best, Dr. Garrod, who gives an admirable skeleton-outline of it at the end of his well-known "*Essentials of Materia Medica*," does not make even the remotest allusion to it,—does not even name it,—while of course it can have no place in the British Pharmacopœia. It is the whole science of the VIS MEDICATRIX NATURÆ, and its workings.

12. This branch—which may be called the department of *Natural* Therapeutics,—in contradistinction to what may be called *applied* therapeutics, or the therapeutics of Art (alone treated of in the books) comprises all that relates to the spontaneous decline and cure of diseases,—to the modes and the processes of healing as occurring spontaneously in disease,—independently of Art, or as uninfluenced by remedies.—It includes all that relates to the provisions of Nature, that is, of the living organism, for the spontaneous decline and cure of diseases, for removing the organic or other lesions induced in the organs by disease, and for bringing about the re-

storation of health. And all this as occurring or effected *naturally*.—I think I have by varied expressions so put before you what I have in view, as to leave you in no doubt as to my meaning.

13. This subject of Natural Therapeutics,—of the curative powers and processes of the living organism is a large one. But where is it treated of anywhere? It is incidentally alluded to here and there in books,—in books on Practical Medicine and Surgery. But it is incidentally only, and very sparsely. Least of all is it alluded to,—or say treated of by writers on Materia Medica and Therapeutics, whom it specially concerns to expound it in detail. We have not a single treatise on it—setting forth the *principià* of the VIS MEDICATRIX NATURÆ,—giving the details of its workings or of the processes by which the organism works out the cure of its own diseased states and the repair of injuries. An eminent living teacher of therapeutics—M. Gubler, of Paris, makes this unqualified affirmation—"l'organisme se guérit lui-même." If this be true, it is surely a great truth in therapeutics. It must needs be its foundation-truth in fact; and it demands that the whole set of facts included under it be set forth and in detail as the *first lesson* in that science.—Dr. Alison, indeed, gives a singularly complete yet very brief epitome of it in his "Outlines of Pathology and Practice of Medicine" (pp. 43—46, *et passim*). And apart from him, the only writer we have (that I know of) that treats expressly of this subject, is the late Sir John Forbes,—in his well-known work of "Nature and Art in the Cure of [illegible]"—his "Legacy," as he called it, to the pro-

fession. An admirable work in my opinion it is. But it is not a systematic,—still less is it an exhaustive treatise on the subject of natural therapeutics. The object he had in view in it was simply to assert and vindicate a principle,—not to unfold that principle systematically and in detail. His object was to assert the power and the efficiency,—nay, the supremacy, the sovereignty of Nature in the cure of disease. It was said at the time it appeared,—it was said too by the men I have designated our therapeutic malcontents,—whom I may also designate our therapeutic alchemists, that Sir John had thrown Art overboard, and was a therapeutic nihilist.

14. No more false charge was ever made.—Sir John was in no sense a nihilist. He acted handsomely by Art while yet he asserted the sovereignty of Nature. He said no more in behalf of Nature than men had done that were never charged as he was. He said no more, as we shall see, than Hippocrates, and Sydenham, and Stahl, and Gubler, and Alison, and others have done. The speciality of his offence was this, that he wrote a whole treatise bearing on the subject, while those others standing on the same platform with him, gave expression to their sentiments incidentally only, or only in brief.

15. This whole subject we shall have to consider hereafter. Indeed the consideration of it will prove the main subject of this series of Lectures. Meanwhile, not to keep too long out of view the pith and marrow of what I wish in this Introductory Lecture to put before you, I beg to say, and I would say it emphatic-

ally, that we never can or shall have a satisfactory system of therapeutics, I mean of applied therapeutics, for such is what our malcontents have in their eye, until we have as its basis, a system of natural therapeutics, until we know and have before us in form and in detail the whole facts bearing on what Nature, *unaided*, can do, and what she cannot do in the cure of disease. And by this word Nature, let it be clearly understood, I mean the living organism itself and its inherent vital powers.

16: In all those diseases, and they are many, in which Nature single-handed, unaided by remedies, uninfluenced by anything save regimen only (and this merely to give her fair-play and not place her at a positive disadvantage) is competent to their cure, and which she could cure as effectually of herself as were she never so assiduously succoured by Art,—surely, in all such cases Art must count for nothing, except in respect of aiding Nature, or coming in aid of her in carrying on her own curative work. But then as to this aiding of Nature, what is its instrinsic therapeutic value? Nothing more difficult than the appraisement of it.

17. I do not overlook the fact that in all diseases, even those that are in their own nature of the slightest, Nature will now and then be taken aback, that in all diseases, even in those that naturally admit of cure, and in which Nature is adequate to their cure, there may be from circumstances, or there may arise a tendency, more or less strong, to an unfavourable issue, nay, to a fatal issue. Here Nature is so far impotent. And here Art may carry the day over her, so far. This

makes it necessary that we also study that part of the natural history of diseases that relates to their *modes of fatal termination*. These are various. We may have death occurring from failure of the heart's action, sudden or gradual, constituting either (sudden) syncope, or (gradual) asthenia. We may have death from a direct exclusion of the atmospheric air to the lungs, constituting asphyxia or apnœa; or we may have death from loss of consciousness or coma, this leading, albeit indirectly, to exclusion of air from the lungs. Here, unquestionably Nature fails, or may fail. Here, if life is to be saved, Art must interpose. And here, let me remark, Art often does interpose most successfully. Here, also, it is, let me say further, that our most assured satisfactions as medical men often lie. In many cases we may ward off death. But this accomplished, the tendency to death obviated, we may have nothing more to do, or nothing further may really be in our power. Nature unaided will very often do all the rest. In inflammation of the windwipe with œdema of the glottis, we do not in any sense cure the disease. We have not time to do it even if we could. We lay open the windpipe with the knife and insert a tube. That is all. Nor in this particular case need we seek to do more. We place the patient in a position of safety. We put his life out of peril, and then leave Nature to cure the disease at her leisure.

18. The practical value of the knowledge of this part of the natural history of diseases, that is, of their modes of fatal termination, is, not in any degree or necessarily to enable us to cure diseases, but to indicate how we

may best and most effectually ward off a fatal issue. Nothing more. In the great majority of such cases, we merely avert impending disaster. This done by Art, Nature does the rest and completes the cure.

19. In short, before we can take one single step towards the rearing of a satisfactory system of therapeutics, we must have a system of natural therapeutics for its basis. It must be laid down on the lines of natural therapeutics. We must know in detail how Nature works in effecting the spontaneous decline and cure of diseases, what provisions there are in the living organism for bringing about that result in every kind and variety of disease. And we must know also wherein Nature is incompetent to that end, wherein she fails to attain it and how. In a word we must know all that relates, as well to the modes and the processes of Healing as occurring spontaneously, as to the modes and the processes of Dying as resulting naturally from diseases.

20. How this field has lain neglected by teachers of therapeutics, uncultivated, is indeed marvellous! We have loose, vague notions regarding it, but we have no work, in English at least, that treats expressly of this whole subject, unfolding it in all its several particulars. Such a work might easily be written; and the vital importance of the subject in relation to the science of therapeutics and the practice of medicine urgently calls for such a work. Might not the Royal College of Physicians of London provide that one or other of its annual courses of lectures, the Goulstonian, for example, should be devoted to this subject until the professional

mind of the kingdom is duly saturated with it. Then will the teachers of therapeutics rise to the full conception of what is required of them in imparting instruction in that great science to their pupils: and then also will our therapeutic malcontents be put to silence.

21. It is clear that all that we can really claim for Art is, precisely, that in which Nature fails and in which Art succeeds in effecting a cure, or in giving relief from suffering. This, and nothing more than this is what we may legitimately claim for Art. Nature and Art may go hand in hand together in the cure of disease, in the alleviation of pain and suffering, and in saving life. But let not Art arrogate to itself more than is its due. And let it work assiduously in its own proper field. In this field much yet remains to be done.

22. To conclude. In the treatment of disease, then, two factors are engaged—Nature and Art, the living organism and the physician, and both running, when the physician acts his part aright, in the same grooves. Such being the case, how *can* the science of applied therapeutics ever be such as we should all desire? It never can: it never will. Herein, in the cooperation of Nature with Art, lies the difficulty that constantly besets us, the difficulty of discriminating between a cure and a recovery, two widely different things, and of drawing the line between *post hoc* and *propter hoc*. And it is to ignorance of the respective provinces and the relative powers of Nature and Art, or to the culpable disregard of what is known of these, that all or most of

the quackery inside the profession as well as out of it is to be ascribed. And I apprehend that those that speak in the damnatory terms they do of the science of therapeutics and of the actual practice of medicine, are those especially that do not themselves know, or realize as they ought, the exceptionally peculiar footing on which that science and this practice stand. The knowledge of it and the due appreciation of it would at least teach them the lesson of modesty.

LECTURE SECOND.

The science of Therapeutics must have its root or its point of departure in the knowledge of the natural history of diseases, and, specially, in what is known of the favourable and the unfavourable terminations of diseases. Reference to Sir William Hamilton's famous question "Has the practice of medicine made a single step since Hippocrates?" The proper answer to this question more Scottico: "*Is Nature other or different from what it was in the days of Hippocrates?" For Nature as well as Art is concerned in the cure of disease; and Nature chiefly. Remarks and illustrations as to the respective provinces of each of these, and the bearings of both on the science of therapeutics.*

1. It is well remarked by Dr. Flint, as I observed in my lecture of yesterday, that the "knowledge of the natural history of diseases is the true *point of departure* for therapeutics." In these few pregnant words we have the expression of what is, I apprehend, a cardinal principle in that science. And in further relation to this science, Dr. Flint has given expression to another cardinal principle in it, in saying, that our therapeutic measures have to be considered as they bear on "the *intrinsic tendency* of diseases to *recovery* or *otherwise*," that is, to a favourable or an unfavourable issue.

2. It is obvious, indeed, on a little reflection, that

the science of therapeutics must take its rise, or have its root, in what is known of the whole natural course and progress of diseases; and, still further, as indicated by Dr. Flint, that the part of that history that bears most directly on this science is that which relates to the natural *terminations* of diseases, or the modes in which they come to an end, whether in recovery or in death, or in an intermediate state of chronic ill-health—a state in which while life is conserved full health is not regained.

3. When we learn from that history of diseases (now happily designated their "natural history"), that the inherent tendency of a particular disease is towards recovery, and also, that nature is of herself sufficient and all-sufficient for the cure of it, it is plain that there is no real occasion for the exercise of our Art. It may be, however, that the tendency in question may be promoted or aided by the appliances of Art. To what extent there will be room for the exercise of it, and what the kind of intervention suitable, will in all probability be indicated by what is known of the mode or modes in which the spontaneous decline of the disease occurs, or by which it is brought about. But, on the other hand, the tendency of an individual case, or set of cases even, of a disease that is in its own nature curable, may be from the first or sometime during its progress to an unfavourable issue—to death; and yet that tendency may admit of being effectually counteracted. Here there is *special* room for the exercise of our Art. And the direc-
which it may be most beneficially exerted, will
if not wholly, be indicated by what

we know of the modes in which that particular disease proves fatal. Thus, if it be in the way of syncope or asthenia, certain appropriate measures will be requisite; if in the way of apnœa, certain others; and if in the way of coma, others of a different kind.

4. Nothing more true, then,—or more happily put in our view than the two assumptions of Dr. Flint just referred to;—*First*—That the knowledge of the natural history of diseases, that is, of their whole course as uninfluenced by Art is the true point of departure for therapeutics; and, *secondly*—That the part of that history that bears most directly on this science is that which relates to the natural terminations of diseases, whether in death or in recovery.

5. This knowledge is in fact the only sure foundation on which the science of therapeutics can be reared. The tendencies of diseases this way or that may be said to be the main pillars of it. And, accordingly, in relation thereto, what above all things we have to do in the study of diseases, is, carefully to observe and rightly to acquaint ourselves with the modes and the processes by which, on the one hand, in favourable cases, their spontaneous decline and cure is brought about,—and, on the other, in fatal cases, the fatal event is produced.

6. The therapeutics of Art, therefore, must rest on what may with propriety be termed the therapeutics of Nature,—nor less, nay very specially, on the mortal issues of diseases. For in the latter lie the special work and often the signal triumphs and satisfactions of Art. But along with what we learn from the study of the

natural history of diseases, we must ever take with us the lessons we derive from pure empirical *experience* in the treatment of diseases. In the nature of things, these lessons must ever be more or less uncertain,—more or less fallacious. Nevertheless, they will ever continue to be, as heretofore, the only foundation of much of our knowledge in therapeutics, and in many cases our only guide and stay at the bed-side. Theory apart,—science notwithstanding, we know that this remedy or that does good in this disease or that. Compatible or incompatible according to the findings of chemistry, this particular combination or that is a certain cure for this or that disease. But you cannot fail to see that it is in this field,—the field of pure experience, that our difficulties lie,—and that it is the occasion of our contentions and bickerings. Still we cannot put it away from us,—we cannot dispense with it. We must accept it,—and accept it thankfully—with all its drawbacks.

7. Reverting now to what was before us a little while ago, I may next remark, that in the daily conduct of the professional life, the main objects we have in view (speaking generally) in the treatment of the cases we are called on to treat—in all at least that are serious or severe, are, *first* and foremost, to have an eye to the danger-signal,—to the tendency to death—either in sight and impending,—or (as judged of by the known history of the disease) to be looked for sometime in the sequel,—and this in order to be prepared to meet and counteract it; and, *secondly*, to have an eye to the cura-

tive processes of Nature in the working out of the spontaneous cure of the disease,—and this in order to help her in it. Other objects of practice there are, no doubt, in many cases; but they are all of them subordinate to these two; and of these, the former must always have the foremost place in our regards. These rules, or maxims of practice may not always be *formally* held in view, yet they will ever be in the mind of the scientific practitioner, guiding him in his conduct. And in as far as they fail him, or are inapplicable, he will then fall back on the teachings of experience. In not a few cases, in which from his knowledge of their natural history, he sees that no danger need be apprehended, and that he can really do nothing towards expediting the recovery, he will wisely deem it expedient to let well alone, or content himself with placebos for the satisfaction of his patients and their friends.

8. Since therefore, I repeat, the natural history of diseases is the true point of departure for therapeutics; and since the part of that history that stands immediately related thereto, is all that bears on the inherent tendencies and the natural terminations of diseases whether favourable or unfavourable,—the knowledge of the modes and the processes of Healing as occurring spontaneously in diseases, and of the modes and the processes of Dying as naturally resulting from them, must form the only solid basis on which a satisfactory system of therapeutics can be built up,—or such as will meet the denunciations of the malcontents.

9. The several facts constituting this body of knowledge, synthetically brought together and methodised

would of themselves form—virtually they would—a system of Natural Therapeutics. And the knowledge thus acquired of Nature's own ways would form the basis of a rational system of treatment at the bed-side. It would shew us, on the one hand, how we may best promote such of the natural tendencies of diseases as are of a favourable kind, and, on the other, how we may best counteract such as are the reverse. In either case, it would enable the physician the better to direct his aim aright or with scientific precision, and to judge rightly as to the adaptation of means to ends in order to attain the object he has in view,—whether to bring about recovery or to stave off death. And it would, besides, enable him to form a truer estimate of the positive value of his services and guard him against error and self-deceit.

10. To unfold both these parts of the Natural History of Diseases, as the basis as well of a system of Natural Therapeutics as of a system of Applied Therapeutics, is what I propose attempting in these Lectures.

11. An exposition of this kind is still, I apprehend, a *desideratum*. The subject, as I remarked yesterday, is nowhere treated of in a detailed or systematic way. And if I must needs in any way qualify this statement, let me say, that it has not yet been done in relation to its bearings on Therapeutics. We have no work that I know of, on Therapeutics in which such an exposition is given. In M. Gubler's *Commentaires Thérapeutiques*, we have two golden aphorisms,—hereafter to be brought fully before you and in part already given you,—

in one of which he says "L'Organisme se guérit lui même." But he does not go into details respecting this power of the organism, not even incidentally.

12. Strange it has long seemed to me that the subject in question should be so overlooked as it has been by writers on Medicine. We have treatises on almost every speciality in Medicine and Surgery. We have not one on this. It is a sort of "No-man's-land," open to all, yet neglected by all. Nor is it taught in our Schools. Therapeutics indeed is professed to be taught. But in as far as really taught, it is Applied Therapeutics only: Therapeutics apart from its basis—Natural Therapeutics. And taught in connection with the Materia Medica, it is taught in England at least, during the first year of medical study—a period when the student is quite incapable of taking in even the simplest elements of it. For how can he, ignorant as he is of Physiology and Pathology, of Practice of Medicine and Surgery? Strange that it should be divorced from these! Its fitting place, in a sound system of professional education, would be at the end of these branches (in the fourth year) and as the *complement* of them. The most important really, and the highest of all the branches of medical study, because the more immediate foundation of our Art, it is not really taught in our schools, otherwise than incidentally. And to this neglect of it, to the neglect above all of any teaching in the department of natural therapeutics, or of the curative powers and processes of Nature, Sir John Forbes rightly ascribes the errors and the misconceptions as to the respective provinces and the relative powers of Nature

and Art that so widely prevail among ourselves,—to say nothing of the general public, who in their ignorance of the entire subject fall into the gravest errors, and who, attributing the cure of diseases wholly or almost wholly to Art, and in no degree or next to none to Nature, readily become the victims of every species of quackery or lend their ears to the specious pretensions of Homœopathy,—a system which seems to credit Nature with nothing save her law of similars,—a law too, it would appear, given to man to work by, not a law by which she herself works in effecting the cure of diseases!

13. Need it then be wondered at, as I said yesterday, that we read from time to time in medical books, or that we hear it said in professional converse, that therapeutics—in its scientific relations especially, is in a most unsatisfactory condition, nay, that it is in a "disgraceful" condition? Much as in all its other branches, Medicine has advanced within the last half century, therapeutics, it is affirmed, has stood nearly stationary, or at least it has made no progress at all commensurate with what might reasonably have been looked for.

14. The allegation may be allowed so far. It may freely be conceded that Therapeutics has not made the progress which those that speak of it in that damnatory strain would desiderate. But it is plain that the persons who thus speak have no clear apprehension of the real footing on which the science of therapeutics stands. In 1832, Sir William Hamilton, the late eminent Professor of Logic and Metaphysics in the University of Edinburgh, asked "Has the practice of

Medicine made a single step since Hippocrates?" Now, assuming that Nature, that is, that the living animal body, is an agent in the cure of all diseases that are intrinsically curable, and that she is the real and efficient agent in their cure, one answer to Sir William's query—and perhaps the best, might be given (*more Scottico*) in the form of another query,—namely this, Have the curative powers of Nature made a single step in the way of increased efficiency since Hippocrates? We may at once set aside as irrelevant, in the way of reply to Sir William's question, all that may be advanced in respect of vaccination, chloroform, etc, and all criticism of the expression "a single step."

15. And in reply to this other question it may at once be said that the curative powers of Nature have *not* made a single step in that direction since then,—that they are very much the same now as then. In some civilised countries, the value of human life may have risen; more children may be reared and the average longevity of mankind increased. But taking our race the world over, men now live and die much as they lived and died in the days of Hippocrates. Whether in putting his question Sir William Hamilton had this consideration in his view, I cannot say. If he had not, and if with the querulous ones he thought the actual state of our modern therapeutics a "disgraceful" one, he may fairly be said—eagle-eyed as he was—to have overlooked one essential fact underlying the question put by him.

15. That our science of therapeutics is in an unsatisfactory state is, I apprehend, only too true. But this arises from the misconceptions and the errors that prevail among us in regard to the respective provinces and the relative powers of Nature and of Art; and it will continue to be unsatisfactory until those misconceptions and errors are taken out of the way. The therapeutics of Art, I have said, must rest and be built upon the therapeutics of Nature. Until this is done, and done *in form and in detail*, and made a *branch of medical education*, the therapeutics of Art will remain in an unsatisfactory state. In a golden sentence in his admirable work, "*Nature and Art in the Cure of Disease*," Sir John Forbes has put this very pointedly. "It is only on the *complete impregnation* of the student's mind with this *fundamental* knowledge, that any growth of rational views in regard to the treatment of disease can be based, or that the establishment of a medical art on philosophical principles can be looked far." (Chapter I.)

16. In repairing a broken or a damaged time-piece, the repair, or as we may say, the cure of it, is wholly the work of the artificer. He is beholden to Nature, indeed, for the strength and other qualities of the materials he uses. But he is beholden to her for nothing more. His restorative handiwork is entirely his own; and, accordingly, the value of his methods, and his own skill as a workman, admit of an easy appraisement. Moreover, there is scarcely any limit to the progress which he and his fellow craftsmen, working from age to age, may not make in the business of their art. The watch of the present day is, no doubt, a very superior one to the watch worn by Hippocrates—if indeed he had one.

17. It is far otherwise, however, with the diseased or the damaged human body. In the cure of it, there is always another factor concerned besides the physician; while in his methods of cure the latter is confined within certain limits—limits which he cannot overpass.

18. That other factor is Nature. It is the living organism. It is a certain power, or powers, forces, or energies of a curative order inherent in it. And it is by virtue of these, or by the exercise of these, *in part at least*, that diseases subside or are cured—spontaneously we say, and that injuries are repaired independently of Art. This is a fact. What that power or these powers are, we do not at present inquire; nor do we inquire as to the extent to which they operate and thereby avail for the relief or the removal of human suffering and disease. It is simply the general fact we are just now concerned with. The modes, the processes of Healing, of cure and recovery, as carried on by Nature, we meanwhile leave out of view. But that she is an agent concerned,—that the living organism is itself endowed with curative powers is a fact.

19. And in connection with this general fact, it is in the highest degree important that we take along with us this other fact, namely, that in most parts of the world, in all times and to this day, Nature is and has been the *only* factor. Take the human family the world over, and in all ages: we shall find that the million to a few stand outside the pale of the medical art, and have ever done so. Virtually it is so. And a fact full of significance it is.

20. Now, in relation to the practice of our Art, in

relation also to our estimate of its positive value, and still more in relation to its scientific basis, it is plain that no satisfactory *progress* can be made in the Science of Therapeutics until we have clearly ascertained what Nature herself *unaided* can do and what she cannot do, and also *how* she works in the healing of the diseased organism. The facts bearing on this, clearly established, and logically generalised, must be the basis of all researches on the therapeutics of Art,—the other factor concerned in the cure of diseases.

21. Let one simple illustration suffice meanwhile. In the case of a broken arm the surgeon "sets" the limb: he puts the broken ends of the bone in due apposition, and in such manner as that the apposition shall be adequately maintained for a time. That is all he does—it is all he can do. Nature does the rest. In her own way she causes the broken ends to cohere—to unite; and in due time she makes the entire shaft as strong as it was before. Had she no power to do this, the bone would remain broken.—The surgeon's art would be powerless to bring about the soldering of the ends of the bone. This is the work of Nature and of Nature alone. The surgeon merely builds on the foundation laid by Nature; he only comes in aid of her. Acquainting himself with everything relating to the formation of the "callus," he turns his knowledge to practical account. And much he learns that is curious and interesting as well as important. He learns, for instance, that Nature, blind so far, and handless, has no power to "set" the bone if its ends overlap; but that she still pours out her callus, glueing together the

broken ends the best way she can, and even filing down asperities in a wonderful way.

22. I have said that a system of Natural Therapeutics should embrace an exposition of the modes and the processes of Healing, or of recovery from disease, as occurring spontaneously. For, without a knowledge of this, how can we estimate aright the real—the intrinsic value, or the precise mode of action of any article of the *Materia Medica*, or of any other remedial agent? We must first of all know the corresponding power or powers of Nature, and the mode or modes in which she works out the cure of diseases and brings about the restoration of health. Suppose we have ascertained as regards any particular disease, that Nature is herself adequate to the cure of it,—that unaided she will cure the disease, and as effectually and as speedily as she would were she never so judiciously succoured by the physician and his appliances: In such a case, as Sir John Forbes remarks, Art, on a fair reckoning, must needs count for very little. And yet how often, through sheer ignorance, is Art credited with everything, and Nature with nothing!

23. Thus important it is to know how Nature works in the ministry of Healing,—to know the modes and the processes by which she works. An exposition of these would form the *First* Division of a system of Natural Therapeutics. And the practical use of such a system would be (as I have already said), to instruct us how best to aid Nature in her own curative work. It would also guard us against error in our estimate of the value of our Art, and guide us in our observations as to

the actions of the several articles of the Materia Medica and other remedial agents.

24. I have said, too, that a system of Natural Therapeutics should for practical purposes embrace also an exposition of the modes and the processes of Dying. This would form the *Second* Division of such a system. As to this other division let me again dwell on it a little while; and if on a matter so important you find me repeating myself, I hope you will bear with me. It is, in fact, of set purpose that I do so. In matters important, especially if misundertood or overlooked, iteration—repetition—is even the duty of a teacher.

25. Now, in many cases of disease, as well chronic as acute, the main thing the physician or the surgeon has to do is, to have a watchful eye to the modes of dying,—to the sources whence danger may arise,—to the indications of impending death. If he can but successfully meet and obviate these he will very often do all he need attempt or seek to do,—save in the way of placebos. In many cases, Nature will do the rest for him and without him. In the whole of that vast class of diseases called *zymotic*, "to obviate the tendency to death" may be said to be our foremost consideration as medical men. And it was with reference to one of the diseases of this sort that Dr. Cullen gave expression to that injunction of his—even since spoken of as his "memorable" injunction. How important then to be familiar with the modes of that tendency as pointing to the means of counteracting it!

26. It is here: it is in this field of action that we may often do the most real good, practically, to those

committed to our charge. It is here that the most signal triumphs of our Art lie. It is here that, from time to time, we have our most substantial and best assured satisfactions. We are often credited with saving life when we know, inwardly, that on that ground nothing is really our due. But how sweet the thought, even if graced with no acknowledgment of the fact, that we have indeed saved a life that but for us would to a certainty have been lost!

27. Suffer me two illustrations.—An Hospital Surgeon in Paris, making his round of visits one morning in his wards, came to the bedside of a patient admitted the night before. The man was suffering from *Laryngitis.* It was well marked and decided. But at the time of visit there was nothing urgent in the symptoms, nor had there as yet been anything urgent. Yet, straightway, this surgeon called for the requisite appliances, and laying open the patient's wind-pipe inserted a canula. The operation finished, he remarked to the students around him that on due reflection, he deemed it his duty to do what he had done,—his object being to put his patient in a position of *assured safety.* There was nothing, he said, directly calling for the operation, nor might there be in the future. But the ailment was one that might at any moment become dangerous,—that might be fatal in a few minutes, and at a time when there might be no help at hand. On these grounds he did what he did. He acted well and wisely, I think.—The operation was a painful one. But the contingency was a vital one: a life was at stake and in peril. It was a life assurance at a tolerably high rate of premium.

Yet the assurance was worth the price. Better this than the announcement next morning of an interesting *post-mortem* after the visit!—or than the intimation that *unfortunately*, late in the afternoon of yesterday, in the absence of the *internes*, with no one at hand to operate, there was a sudden accession of spasm or of *œdema glottidis*, and that after a fifteen minutes struggle, the patient died! I have always looked upon this case as one of the finest illustrations of Cullen's "memorable injunction." The mortality,—nay even the preventible mortality, from that disease is unquestionably large; and many surgeons would do well, if in the treatment of it, they acted as this French Surgeon did—obviate by *anticipation* a fatal issue or rather the possibility of such an issue.

28. Another illustration,—one, too, in which the treatment adopted had also an exclusive reference to the principle of obviating the tendency to death. Thirty years ago, I was urgently summoned to a patient—a relative of my own, supposed to be dead or dying. The patient was a lady of middle age; and, half an hour before, she had been seized with hæmatemesis. I saw her at once; and I had shewn me a large basin nearly full of blood. The patient, lying in bed, was white as a sheet and virtually pulseless. She seemed to me moribund. Taking my place by the bedside, I called for a bottle of brandy. At once I gave her a wineglassful of it—undiluted. In a little the pulse became perceptible: some colour came into the cheeks. After a while, up came a great gulp of blood: away went the pulse, and away all colour from the cheeks. Another

glass of brandy was given—with like good effect—the pulse reviving, some colour returning. For four hours it was a conflict between death and the brandy-bottle. Within that time—within four hours—this lady drank one quart and a quarter of brandy—with no intoxicating effect whatever on the brain. No doubt much of it was ejected by vomiting; but much more of it must have been absorbed, and. in the circumstances (as illustrated by Majendie's well-known experiments in regard to the process of absorption) very rapidly absorbed. In "the struggle for existence," the brandy in the end prevailed. Gradually after many repeated vomitings of blood and many swoonings, the hæmorrhage abated; and finally it ceased—the lady making a complete and a permanent recovery. In this case, which made a deep impression on my mind, there never was a doubt with me but that the patient's life was saved by the brandy counteracting the tendency to death. My abiding belief is, that had I not seen her at the precise time I did,—and done exactly what I did she would have died, and within a few minutes,—so extreme was the loss of blood and so complete the syncope.

28. To conclude. Much more, as I have already said, lies in the way of looking at diseases and their treatment from the points of view now presented, than many suppose;—much in respect of the satisfactions accruing to one's own mind in the practice of one's profession, and in guarding one against error and self-deceit. But how much more would be gained, in the rearing of a stable system of applied therapeutics, were we all to labour at the task from a common stand-point!

29. Before grappling with our proper subject, there are some matters of a preliminary kind that demand attention. One is, the views that are held as well by the public as by the profession generally, in regard to the respective provinces and the relative powers of Nature and Art. Another is, the views that have prevailed at different times in the Schools of Medicine as to the nature of the curative powers and provisions of Nature,—or as to the nature of the *Vis Medicatrix Naturæ.* And the consideration of these will lead me to inquire what disease really is,—or what it is that we understand by this word—Disease. It is plain that we must have a definite idea of what disease is, before we can understand how Nature works in the cure of it.

30. The lectures immediately following the present one will deal with the preliminary subjects now indicated. And if in these lectures there shall be found repetitions, I would plead that they are unavoidable; while in respect of a subject so little dwelt on—systematically at least and in detail, either in books or by teachers, such repetitions may serve to lodge more deeply and firmly in your minds principles, facts, truths which may well be designated *cardinal.*

LECTURE THIRD.

The popular and the professional views as to Nature and Art in the cure of disease. I. The popular estimate of the power of Art high, but founded on a misconception of those of Nature. This estimate specially high among homœopaths. II. The professional estimate of the power of Art very various, yet on the whole high and perhaps unduly so. Causes of this, among others, moral causes; the blinding influence of these. George Herbert's caustic remark. The aggregate of the profession chiefly held in view in that estimate.

1. The subject I purpose considering to-day is one of peculiar interest and indeed of real importance.—It must have been often thought of and much debated; and yet it may confidently be affirmed, I think, that it is one in regard to which great misconception prevails, and further, that this misconception lies at the root of all the quackery—voluntary and involuntary that obtains in the world, and as well in the profession as out of it.

2. (I.) What is the popular idea of the respective and the relative powers of Nature and Art in the cure of disease? What especially is the popular idea of our Art and its value? What the idea of the mass of the people of the kingdom? For the purpose I have in view, it will not be necessary to dwell long on these questions.—A mere outline of it is all I contemplate,

and this in order to give completeness to my sketch of the subject as a whole.

3. Very wide of the truth of things, the popular idea is. The belief commonly entertained and shared in alike by the educated and the uneducated is (as Sir John Forbes remarks), that in the great majority of cases of disease in which treatment is resorted to, and the patient is restored to health, the main agent concerned, if not indeed the sole agent in the restoration, is the treatment resorted to, the drugs prescribed and taken,—the skill of the physician,—in one word Art. Nature is not so much as thought of in relation to it, or her share in the work is trivial. No doubt, some have little or no faith in physic, and great faith in the powers of Nature. But these form an infinitesimally small number of the people, whether educated or uneducated. Art, in short, is by the public generally regarded as all in all, or nearly all in all. Nature counts for nothing or for very little.

4. That thus it should be with the public need not be matter for surprise. They know scarce anything of Medicine as a science,—scarce anything of life physiologically considered, and as little, scientifically, of diseases or of remedies. All these are subjects that in their scientific relations lie outside the sphere in which the public mind moves. So little, in fact, do highly educated laymen know of medicine that Dr. Cullen used to say in his lectures, that he found it quite as easy, on any point connected with it, to "bamboozle" a learned lord of session in Edinburgh as to "bamboozle" a ploughman's wife. Almost any dictum confidently

delivered will go down with and be accepted by both alike. The Lord Chancellor of England and the Lord Chief Justice, for the time being, may be presumed to be among the foremost men in the kingdom in respect of sense and intelligence. Yet, if either be sick,—and if the family doctor,—a humble apothecary he may be, shall tell him unhesitatingly yet perhaps with no sufficient warrant from the facts of the case, that he is labouring under congestion of the liver, what can he say? He cannot gainsay the diagnosis made and declared. And, supposing the case obscure, if the consulting physician called in, seeing his way no more clearly than the apothecary, shall concur in the view of the latter, there is an end put to all further question,—and straightway a bulletin issues—signed and countersigned;—and it is telegraphed over the kingdom. And yet a *post-mortem*, subsequently made, may reveal something widely different from what was anticipated. And so as to the treatment pursued: the doctor is sent for because it is believed that he can *cure* the disease, knows how to do it, and is possessed of the requisite means for doing so. He is trusted in without question, both as to his diagnosis of the case and his treatment of it.

5. It need not therefore be wondered at, if the public entertain as they do an over-weening confidence in the power and resources of the medical Art, and a low estimate of those of Nature. "When (as Sir John Forbes says) the observer sees bleeding, blistering, vomiting, purging, and all the other heroic arms of physic brought into action *against* the disease, and

with the avowed object of *curing* it; and when the disease is *seen* to abate or disappear within a short period after their employment, the inference seems inevitable that the artificial treatment was the *exclusive* agent in effecting the cure." The heroic arms of physic are not now indeed plied with the vigour of former days. Still, plied to the extent they are, they lead to the inference just indicated; and the words of Sir John continue to this day to depict very accurately the position of the public.—Nor is the popular idea restricted to acute diseases. Even in chronic, it is not doubted, as Sir John observes, that when recovery eventually takes place, the cure is due, or mainly due, to Art. Nor, even when diseases prove fatal, is it doubted that life has been prolonged by Art. Nay, so great is the reliance of the public in Art, that on occasion it turns the tables on the profession. One dies.—Why did he die? Not from want of power in the medical Art, but by reason of ignorance on the part of the medical man in attendance,—who knew neither the true nature of the disease nor the proper remedies for it.

6. What I have now said represents fairly, I think, the state of public opinion. How far the educated classes have of late years come to participate in the more enlightened views of the profession, it is not easy to say. Having in view, however, the *aggregate* of them, it need count for very little. They probably know [illegible] beyond the general fact that the *Lancet* is [illegible] than in bygone years. They still have

7. In any review, however, such as this, it would be a material oversight not to take note of the fact that, within the last thirty or forty years, among the educated classes especially, and more particularly among the landed aristocracy and the clergy, the clergy of the Church of England in chief, no inconsiderable number have gone in for homœopathy as well (some of them) as for a change in their religious beliefs. What is remarkable as to this class is, that they have if possible even greater faith than the ordinary public in the curative powers of Art. That system indeed (the system of homœopathy) in the eyes of orthodox members of the profession, serves admirably to *demonstrate* the curative powers of Nature. In the eyes of the homœopathic community, however, Art as plied by Hahnemann and his followers, in conformity with their imaginary law of similars, is greatly more potent than Art is supposed to be by those of the public that are untainted by that very fashionable system, a system which will in due time "find a resting-place in the grave of other forgotten quackeries."

8. (II.) But how as to the profession generally? You will at once see, I should think, that it is not easy on a subject of this sort to speak of the profession as a whole, comprising as it does many thousand individual members, and taking into view as we ought not those of our own country alone but of Europe generally, and of America and the colonies, in short the trained and legally qualified members of the profession everywhere. No doubt there are national and other peculiarities of therapeutic opinion and prac-

tice. Yet in relation to the question immediately before us, there is probably enough of uniformity of opinion everywhere to let it suffice to adduce that of our own countrymen, or at least the English-speaking members of the profession.

9. With a tolerably general assent and consent, there must yet be many shades of opinion among a body so large. Speaking generally it will be allowed—indeed it is notorious—that medical practice as now pursued, differs widely in not a few particulars from that followed half a century ago. It has in fact undergone what may be said to amount to a revolution, a revolution bespeaking a corresponding change of opinion. I need only instance the comparative or nearly complete disuse of the lancet, of mercury as a deobstruant, of severe blistering, and of active purgation; and the nearly expectant or comparatively mild treatment of pneumonia and other inflammatory affections, of the idiopathic fevers, &c. We have come to trust more in Nature than we were wont to do, to interfere less with her, and to be more conservative in our therapeutic creed and in our actual practice at the bed-side.

10. To this revolution I shall have occasion to advert bye and by. Meanwhile, that revolution allowed for, it is certain, I think, that a large number—probably the greater number of the profession, entertain views as to the question now in hand not differing widely in principle, in *principle* I say, from those held by the general public, [illegible] thi[illegible] at least, namely, that with a high[illegible] the po[illegible] of Nature than the publi[illegible] place their main

reliance on Art, and, practically, to rate Art higher than Nature in the cure of disease. I may be wrong; and on such a question as this I should be loth to dogmatise. Twenty years ago, however, Sir John Forbes found no difficulty in answering it as I have done, if not even more strongly; and the opposition his views then encountered in many quarters evinced the strength of the professional belief then prevalent, in the superiority of Art, albeit the revolution just referred to was then well matured. The years that have since elapsed have not from anything that appears, changed materially the *tone* of professional opinion among the aggregate of our body; while our general practice and our familiar conversation do not, I think, betoken any essential change in our therapeutic beliefs, that revolution always allowed for.

11. On the whole, then, we now as in former days, although not now perhaps to the *same extent* as formerly, set less store by Nature than we do by Art. We still assign– practically we do—the first place to Art, the second to Nature. Frankly admitting the difficulty that attaches to the question before us, and especially attaching to it at the time now present, I think that I have not unfairly represented the views which are held by the great body of the profession.

12. That these views should be such as they are, we shall readily understand if we reflect on the conditions under which medical practice is carried on everywhere, and on the influences that bear on the minds of medical men to the warping of their judgment. One would

imagine, indeed, that the training medical men receive as students in physiology and pathology, and their own observation as practitioners would guard them against any serious error in this field of inquiry. Yet it is not so. Nor does it seem difficult to account for the fact. It is quite certain that unless expressly guarded against it in their earlier years, medical men are just as liable as other men not of the profession to be misled by what they see. For how stands the case as regards almost all medical men? From the time they come to engage in the practice of their profession, and on all through it, it seems incumbent on them, to treat their patients as if the positive cure of their diseases were dependent on them. And so it comes about that many of them never learn to discriminate fairly between the respective provinces of Nature and Art, or to appreciate as they ought the relative powers of each.

13. Were diseases *exclusively* treated by *regimen*, *i.e.*, by attention to diet, clothing, warmth, air, light, rest, exercise, &c., we should have (as Sir John Forbes remarks) a field wherein to conduct observations on disease free of the fallacies that actually environ us; and we could hardly fail to arrive at conclusions in a great measure exempt from ambiguities. Working in such a field, we should all of us unhesitatingly admit the curative powers of Nature, nor should we differ widely among ourselves in our estimate of the extent to which they avail.

14. In the actual state of medical practice, however, the case is widely different. Whether we have regard to hospital, dispensary, or private practice, it is in rare

instances only that diseases are left to themselves, or treated merely by regimen. We have recourse to our drugs, and to our manifold appliances on set purpose to cure the disease, to arrest or cut it short if possible.

15. Such being the case, it becomes exceedingly difficult to discriminate between what may be due to Art and what to Nature, to appraise the respective and the relative powers of each. As medical practice is commonly carried on, carried on by almost all of us, there can be no doubt that the appliances we resort to are potent enough, in many cases, to change, modify, or influence the processes going on in the living organism, and as well the normal as the abnormal. Still more is it the case that medical practice as ordinarily pursued has the effect of blinding our eyes as to the respective operations of Nature and Art.

16. As bearing on this, it may be observed that while the sources of error, of fallacy, and of self-deceit that beset our path and that obscure or pervert our vision are many and great, their name *legion*, the most potent of them and the most blinding of all, are *moral causes*—the love of praise, the desire of credit. Here, on this very ground, the medical man, however true and honest he may strive to be, labours under a serious personal disadvantage. "The object of his wishes (as Dr. Alison happily puts it) is so frequently accomplished under his eyes and during his exertions, and it is so generally ascribed to his skill, that he is always in danger of over-rating the value of his services and the amount of his positive experience in regard to the efficacy of remedies." (*Transactions of Edinburgh Me-*

dico-Chirur. Society, Vol. i. p. 437). Who among us will not gladly appropriate, along with the fee tendered, the thanks also tendered, gratefully indeed yet in ignorance it may be, for a life almost miraculously restored (so it is thought) and due providentially (so it is believed) to our superior skill? Nature in such a case, like charity, seeketh not her own. She will prefer no claim against us and in her own behalf. It is not for us indeed,—it is no business of ours, to undeceive our confiding and grateful patient or his friends, and to assure them that were they but competent to judge, and did they know better, their praise would not be so profuse or so one-sided. Certainly not. But then it is *an occasion of stumbling* to us; it is a source of self-deception; and daily recurrent instances of it may in the end lead us not only to accept praise when offered, but to claim it as a right when none is due, nay even when blame for wrong-doing is merited. Moreover, what if, occasionally, real and grievous error on our part is covered over and concealed by Nature, either secretly counteracted by her in her own way, to the saving of a life which Art was doing its best, (unwittingly) to destroy, or set by us to her account without challenge on any side, or buried with the patient in the grave.

17. No doubt the good George Herbert had something of all this in his eye, when in his quaint way with a dash of the sarcastic, he said, as he does in one of his *Proverbs*, "God healeth: but the physician hath the thanks."

18. In my next lecture I shall have occasion to con-

sider what abatements, if any, must needs be made in respect of the view here presented of the therapeutic beliefs of the profession generally,—and this in connection with certain influences that have of late years been at work in modifying those beliefs. I had occasion in an earlier part of this lecture to advert to a revolution that had its origin some forty years ago in the practice of our Art. It is of this revolution that I will speak in my next lecture,—meanwhile I am content to leave as it stands the view I have now given you of our therapeutic beliefs, regarding it, as I do, as a near approximation to the truth of things. In speaking of the profession generally or as a whole, we must look to the aggregate thousands it comprises, and especially to its *average* mind. Of the many hundreds annually admitted into it, in the three kingdoms, it is well known that the number that "pass" with distinction, that evince gifts and acquirements of a high order, and that afterwards rise to eminence, form a very large minority; and that the great aggregate, like the aggregate of their fellow men in other walks of life, are men of moderate parts, men of routine in their habits of thought and action. Being the aggregate, it is into their hands that the great mass of practice necessarily falls; and while on that very account their professional education demands the first and foremost consideration at the hands of those whom it concerns, namely, our medical schools and the examining medical boards, it is this aggregate that I have had mostly in view in speaking as I have done of the profession. And as this aggregate must live by their profession, and are driven by circumstances, in England particularly, to avail themselves largely of the pharmacopœia, I apprehend that they come like their patients to have faith in physic, and an undue faith in it.

LECTURE FOURTH.

The causes that have retarded the progress of Therapeutics, and the agencies now helping it on. I. Neglect of the study of the curative processes of Nature, and the influence on the minds of medical men of the circumstances under which medical practice is commonly carried on. II. Influence of the more thorough study in recent years of the Natural History of diseases,—of our improved knowledge of Physiology,—of higher general culture in the profession,—of the revelations of Homœopathy—all leading to greater reliance on the powers of Nature, and to a larger disuse of the "Heroic Arms" and the "Artillery" of Art.

1. One reason and a very potent reason why medical men so largely fall into the error of over-rating Art and of under-rating Nature in the cure of disease, is, that their attention is not in early life, or during their pupilage, directed as it ought to be to the foundation-principles of *natural* Therapeutics, that is, to the workings of the VIS MEDICATRIX NATURÆ.

2. We have seen that the circumstances of actual practice, as ordinarily carried on among us, are such as tend strongly, and habitually, and unwittingly, to mislead the judgment. Nor is this misleading effect one that a few months or a few years of practice will dispel. The true relation of Nature to Art is not a

matter so plain as to require no special instruction,—so clear and simple that the young practitioner will soon discover it of himself. The considerations adduced in my previous lecture are sufficient to shew that causes are ever in operation tending powerfully to mislead and deceive us. And one need but listen to the ordinary talk that goes on among us, or reflect on what one reads in the report of cases in the medical journals, to satisfy himself that the prevailing habit of the medical mind, among all ranks and orders of our body, is to sink Nature and glorify Art. Experience does indeed with many dispel to a greater or less degree the illusions of their earlier years. Some, peradventure, it drives into an error the direct opposite of this,—that of unduly disparaging Art and unduly magnifying Nature. Some few it drives into a scepticism more or less absolute as regards both. Radcliffe when young, had twenty remedies for every disease; when old, he had twenty diseases for which he had not a single remedy! Extremes meet here as elsewhere.

3. As to the matter of *instruction* in the foundation-principles of a science so vitally important and yet so full of illusions, as is that now before us, most true and very happily expressed is an aphorism of Archbishop Secker:—"Truth *proposed* is much more easily PERCEIVED than *without* such proposal it is DISCOVERED." Specially true it is of the matter in hand. Some truths there are so quickly apprehended as soon as propounded, that we are prone to fancy that we already knew them, and that (as D'Alembert remarks) we have been told ing but what we knew before. Some truths are so

apparent as soon as stated that we wonder we did not think of them or see them before. This may seem, with some, to hold of the leading facts in Natural Therapeutics; and I can imagine some of you remarking that in these lectures as far as they have gone, you have learnt nothing from me but what you have always known.

4. However this may be with some, it is certain, I apprehend, that not a few even of long and large experience have scarce any idea of the facts just referred to—no clear or well-defined knowledge of them, and that they are not guided in their practice by any special regard to them.

5. Important it is, therefore, that the principles of Natural Therapeutics should be made an express part of the formal teaching in our medical schools. I may be thought to be riding a favourite hobby too hard. I do not think I am. I will make bold to affirm that of all the branches of medical study, there is none more important than this; and I will venture to add, that there is none in respect of which systematic instruction is so much needed. Therapeutics indeed is a recognised branch of the medical curriculum. But it is applied therapeutics only,—or therapeutics in connection with the Materia Medica. Moreover, even in the character of applied, the teaching of it in most schools is a sheer mockery. It is taught all over England. if not also in Ireland, as heretofore in this University, to first and second years' students who are utterly incompetent to grapple with it.

6. But it is Natural Therapeutics, as already defined,

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that I have in view. And this, I apprehend, is not taught at all anywhere as it might and ought to be taught,—and as having its equivalent or co-relative in (Natural) Physiology and (Natural) Pathology. We do not indeed use the prefix *Natural* in speaking of either of these simply because we have no need to do so. But it quite as much concerns us to know what the curative and recuperative powers and processes of the living organism are,—*as inherent in itself and carried on within itself*, as it is to know those of its powers and processes by which life and health are maintained, and those modifications of these that constitute disease,—and which together make up the duly recognised sciences of Physiology and Pathology.

7. Even Dr. Alison has, in my humble opinion, unwittingly led us astray here in his definition of *Institutes of Medicine*. This he defines as a Course which treats of "All the information which has been collected and generalised in regard to the functions of the living human body—as performed during health, as altered by disease, and as influenced by remedies." (Preface to 2nd edition of *Outlines of Physiology and Pathology*, 1833). No one, as we shall hereafter see, has done more than Dr. Alison to set the science of Therapeutics on a right footing. But the Institutes as distinguished from the *Practice* of Medicine is surely as a whole a branch of Natural science. And to speak of Therapeutics as [illegible] (diseased) functions of the living [illegible] to make it a department [illegible] of Medicine. His [illegible] parallelism

that ought to subsist between its three several parts. As well say that Pathology is the science of the functions of the living organism as injuriously altered by those agencies that are spoken of as the external "*Causes*" of diseases, or of Physiology itself, that it is the science of these functions as performed in conformity with those other agencies that we designate "*Vital Stimuli*," or, more generally, the "*conditions*" of life and health. The agencies now referred to are made part and parcel of the sciences of Physiology and Pathology: they are incorporated with them. But they are not made to stand out with the prominency assigned to *Remedies* in the definition of Therapeutics given by Dr. Alison. This definition shuts out from view the curative powers and processes of the organism itself. It speaks only of the diseased actions of the body as influenced by remedies. In my view, Therapeutics (or to use a more parallel expression of Sir Robert Christison's, *Therapiology*) is, primarily, the science of the living body exerting when diseased the curative powers inherent in it, and working out the changes requisite for the spontaneous decline and cure of its diseased states, and so enabling the organism to revert of itself and by itself to the state of health,—remedies aiding in this but not independently accomplishing it. The action of remedies would still constitute a part of the science,—yet *subordinately* or in its own proper place,—just as the causes of disease constitute a part of pathology. According to Dr. Alison, Institutes is the science of Health, Disease, Remedy. Rightly regarded, it is the science of Health, Disease, Recovery. Remedy is the affair of Art. Recovery, that of Nature,—and it may be of Nature *alone;* and in as far as it is so to that extent remedies are even less closely linked with Therapeutics than the external causes of diseases are with Pathology or the external conditions of existence with Physiology. For, while disease cannot be induced without some adequate external cause, and while life and health cannot be maintained without their appropriate conditions, Recovery may occur, and often does occur, independently of any remedial agency influencing the organism from without. There is in truth, a science of Therapeutics that is independent of remedies; and it is this which in my opinion constitutes the essential part of the Therapeutics of the Institutes —namely, Recovery from disease as occurring *spontaneously.* How would Dr. Alison's definition apply here?

8. Excuse me this somewhat long piece of criticism in respect of a matter which in as far as right notions of things are concerned seems to me all important. When foundation-principles are in question, too much care cannot well be taken in exposing fundamental errors and setting truth on its feet. "*Credunt homines rationem suam verbis imperare; sed fit etiam ut verba vim suam super intellectum retorqueant.*" We are often the slaves of the very instrument of thought, often misled by the words we make use of. In the words used by Dr. Alison in his definition of Therapeutics, he has shut out the all-essential factor. And if you will allow me a homely illustration, I would say, not that he has put the cart before the horse, but that he has left out the [illegible], albeit it often happens in the matter [illegible] cart is not needed at all, while the

horse is always indispensable. There is in very truth a science, and a large science of Therapeutics, in which the "functions of the living human body are *un*influenced by remedies."

9. Taught almost nowhere, although much needing to be taught everywhere, the subject of natural therapeutics is only incidentally treated of by a few writers. Of the two text-books on Materia Medica and Therapeutics, one or other of which is in the hands of almost every student of that branch, *namely*, Garrod's *Essentials* and Scoresby-Jackson's *Note-book*, the former, as already observed, makes no reference to it whatever. Scoresby-Jackson indeed does refer to it, and in a way which to my mind is at once satisfactory and unsatisfactory. Satisfactory his reference to it is, by reason of its asserting in the plainest terms the whole principle of natural therapeutics: unsatisfactory because of its brevity, which is such as readily to escape the notice of a student or to leave no abiding impression on his mind. In a work which professes to treat of Therapeutics as well as of the mere Materia Medica, his statements regarding it ought surely to have had greater prominency given to them, and to have been presented in greater detail. I shall quote here *in extenso* what he says; and then submit one or two remarks regarding it. "Suppose (he says) for the sake of brevity, we speak of disease as *disordered vitality*, then we find there exists in the organism itself an *innate tendency* to the *restoration of order*, by means of a force which we call *vis medicatrix naturæ*,

the *healing power of Nature.* . . . . The indications of Nature are doubtless of the utmost value, and the latin phrase is probably near the truth that says *medicus curat, Natura sanat morbos,*—the physician *cures,* that is, takes care of the patient, in the sense, if we may use the analogy, in which the pilot takes care of a vessel in a storm; but Nature *heals* the disease." And Dr. Jackson remarks further, that "what perhaps is most needed in the *present* state of therapeutics, is a combined effort on the part of physicians to ascertain, by means of extensive and accurate observation, how far the *unaided* efforts of Nature are capable of restoring to health," adding this further remark that "if anything approaching to scientific accuracy were ever effected in this direction, it would then be *comparatively easy* to judge correctly regarding the value of any particular medicine or mode of treatment." (*Note-book,* 3rd edit., Part 1.)

10. This is what Dr. Jackson says as to the healing powers of Nature, and full of rich marrow it is. And it is but due to his memory to add, that in his teaching he "devoted lectures to this part of the subject." (*Ibid in loco*). What he says, brief as it is, is thoroughly in keeping with what I have been harping on all through hitherto, and justifies all I have said. He does not seem, however, to have appreciated as I do, the consideration that we are *already* in possession of such a knowledge of the natural history of diseases as to warrant its incorporation into the science of therapeutics, and in such manner as to constitute the *first lesson* hat science. He seems rather to have looked upon

it, all important as he regarded it, as a thing still in the future, still to be worked out, still needing "a combined effort" on the part of medical men to mature it and make it available for practical ends, as well in relation to the science of therapeutics as in relation to the practice of medicine. But once worked out, how valuable in his view the results, making the rearing of a system of applied therapeutics comparatively easy.

11. Gratified I am at finding the whole principle of the views I have put before you thus receiving recognition at the hands of Dr. Jackson. It is nevertheless true, I apprehend, that what I have already said holds almost everywhere in our medical schools, as it does in regard to the works we have on therapeutics, to wit, that virtually we have no teaching on the subject of natural therapeutics, no formal or systematic teaching. It need not therefore be matter of surprise that so much misconception should prevail in the profession generally in regard to the respective provinces and the relative powers of Nature and Art, or that there should be malcontents among us, men seeking to reap where they have not sown.

12. Reverting now to the general subject, I would next observe that agencies have for some time past been in operation that have tended strongly and contributed largely to counteract the errors we are liable to in this whole field of inquiry. General education and scientific culture have made way among us to an extent formerly unknown. Further, the doctrine of the natural incurability of certain diseases has received a final

death-blow. The natural incurability of syphilis, for example, was firmly believed in by many half a century ago. Until within the last thirty or forty years, the like may be said of the acute internal inflammations: woe betide the practitioner who failed in the free use of the lancet, or spared his patients gums. These beliefs have been breaking down, tumbling to pieces, one after another. Concurrently with all this, physiology has made great progress, and along with it physiological pathology and histology. The laws of the animal economy are now better understood than they were formerly: and this increased knowledge of physiology has shed a clearer light over the dark field of pathology. It has led to a more precise knowledge of the whole natural history of diseases, or their clinical history as it is sometimes called; and this has given us a truer "point of departure for therapeutics." And what does that history comprise? It comprises a knowledge of the natural course and progress of a disease, its origin and the reference of this to its proper causes external and internal, predisposing and exciting, together with the rationale of the action of these as far as this may be reached; the rise of the disease till it attains its height; its decline from this till the final cessation of the morbid actions; the nature of these actions, as deflections from the state of health, as far as can be ascertained from physiology or otherwise, and the changes, if any, induced by the morbid actions in the structure of the part or parts affected; the mode or the modes in which the disease ends, whether favourably or unfavourably, in health or in death, or in chronic dis-health, life preserved but health not fully regained. And, finally, this history comprises the whole combination and succession of symptoms, physical signs included, that have attended the disease from first to last. And all this as occurring *spontaneously*. Such is what is understood by the natural history of diseases. As thus defined, it has certainly attained a singular degree of completeness within the last half century. Are we not greatly beholden to Laennec and Louis for putting us on the right road in this direction? And perhaps also to Andral? Be this as it may, it is of a piece with the working out within that period of the whole details of anatomy, and with the strides made in histology and physiology. Much no doubt yet remains to be done before that history of diseases can be said to be complete in all its parts. As to some diseases, that history may be said to be actually complete. We know as much regarding them as we probably ever shall, as much as we require or need care to know. As to others, however, it is different. More or less that is important, and peradventure, is attainable, is still unknown to us, and awaits further research.

13. The bearing of this knowledge of diseases,—and above all of their modes of termination (favourable or unfavourable), on the science of natural therapeutics must, I think, be at once obvious as soon as pointed out. And nothing, perhaps, has of late years contributed more to rational views on that subject, and to a simpler and more expectant treatment of diseases than this enlarged acquaintance with the Natural history of diseases.

14. Concurrently with a better knowledge of that history, Homœopathy has, within the same period, contributed largely, albeit unwittingly,—and under protest from its votaries, to the good cause of progress in the department of natural therapeutics. I spoke a moment ago, in connection with the natural history of diseases, of our knowledge of that history being derived from the observation of diseases as they run their course *spontaneously.* Homœopathy, on a scale by no means inconsiderable, enables us (without any misgivings as to the truth) to depict that history as Nature depicts diseases —pure and simple. It enables us to draw it from sheer observation of them as uninfluenced by anything more potent on the side of Art than regimen. This allowed for, homœopathy supplies a field wherein to carry on observations as to the inherent and unaided curative powers of Nature. It does so, at least, in its original— and what Sir John Forbes calls its honest form,—that in which diseases are treated with nothing more potent than drugs so infinitesimally sub-divided as to be reduced to an almost absolute non-entity,—so infinitesimally attenuated as to be reduced to absolute inertness. The whole efficacy of homœopathy lies (in my belief) in the regimen it enjoins—which it holds to be important and religiously enforces, and in the *Vis Naturæ Medicatrix.* Homœopathy, it is true, does not rest its pretensions on these grounds. It builds itself on the assumption that "*similia similibus curantur,*"—an assumption as purely gratuitous as any ever palmed on the easy credulity of mankind.

15. In concluding this lecture, I may observe that

just in proportion as we have made good our ground in the field of natural therapeutics,—and in proportion also as the knowledge thus acquired has spread itself, like a leaven, through the general body of the profession, the practice of medicine has become greatly simplified.—The "heroic arms" and the "artillery" of physic, have to no inconsiderable extent, within the last thirty years, gone into disuse—been "laid up in ordinary."—We have come, large numbers of us, to confide more in Nature than formerly we did. And yet, in one sense, we have come to be more active in our practice than formerly. Nor is there any real, albeit there may be a seeming contradiction here. We are come to be more *precisely* active and with *more definite aims;* while we have had large and valuable additions made to the resources of our Art. Apart from chloroform and ether as anæsthetics—the bromides, chloral, the calabar bean, and others, the introduction of potent drugs within the system by means of the hypodermic syringe—which we owe to Dr. Alexander Wood of Edinburgh, demands special notice. The activity, however, referred to, has gone hand in hand with Nature to an extent and in a way it did not do before,—or in the days when general blood-letting, and purging, and blistering, and calomel held full sway. There is now, I take it—(large exceptions allowed for) —a more cordial understanding between Nature and Art in the cure of disease. Why, then, should not natural therapeutics,—why should not the workings of the *Vis Medicatrix Naturæ*—have a recognised place in our curriculum of medical study? It would pave the way to a complete understanding between them and an entire reconciliation.

16. One word more. Even already, I fear, I have in these lectures laid myself open to the charge of blowing hot and cold,—of affirming in one breath that the profession, no less than the public, have faith in physic and an undue faith in it,—and in the next that the profession is coming and has in fact come to have faith in Nature.—I am quite alive to this charge of seeming inconsistency. But in respect of a subject so many-sided, it is scarce possible, if indeed it be possible, not at times to seem to be, more or less self-contradictory. "Take an octagon building, and paint each side of a different colour. Fix eight men fronting severally each side. Call them away, and ask them what is the colour of the *building?*—Each will give a different answer; one will say it is white, another yellow, another red, another green, &c. Now, wherein does the seeming falsehood lie?—for they cannot all be right in the answers they severally give. It lies in a false *inference.* Each man, instead of confining his statement to what he saw, declares that the *whole building* which he did not see, is of the same colour with the part that faced him. Shift the parties; and note whether when placed all of them before the same side they do not all agree in seeing white or yellow or red or green, where the colour really exists." (Sewell, of Oxford: somewhat abridged and altered the quotation is).

17. You will at once see the application I would have [illegible] quotation. My subject, like that

octagon-building, is a many-sided one; and my duty calls me to look at it at one time from this side, at another, from that side; and doing this I may, peradventure, appear to you to have all this while been calling white black, and black white. I beg you will bear this in mind and not judge me too hardly.

LECTURE FIFTH.

The views that have been entertained at different times, popularly and in the schools, as to the curative powers of Nature. In the exposition, however, of these views, it will at times be necessary to take into account also, by way of contrast and comparison, yet subordinately, the views held as to the powers of Art. Views of Hippocrates, of the Royal Psalmist, of a Latin Author, of Sydenham, and of Stahl.

1. I purpose now to consider the views that have been held at different times as well popularly as in the schools of medicine in regard to the curative powers of Nature. In doing so, however, it will at times be necessary to take into account also, yet by way of contrast and comparison and subordinately, the views entertained by some as to the powers of Art. For it is by such contrast and comparison that certain who have written on the curative powers of Nature have given expression to their views regarding these.

2. The expression *Vis Medicatrix Naturæ*, or as in the plural, *Vires Naturæ Medicatrices*, is one of the oldest we have; and it is one that holds its place to this day,—in these days, however, only as a convenient and time-honoured general expression. It was a fond notion of the ancient fathers of medicine that there is inherent in the human body a power to cure diseases, a special

curative power. Very various, indeed, and very vague and crude were the notions they had of that power. Crude they could not fail to be at a time when both physiology and pathology, as we now have them, were unknown. By some it was believed not only that there is such a power inherent in the living organism, but also that it is an *independent* power, coming into play only when we are sick, but quiescent when we are well. Such a notion would obviously bespeak this other notion, to wit, that of disease being a specific thing or "entity;" and the exercise or the inaction of the power in question would, clearly, be a criterion of the presence or the absence of disease. Probably, however, the notion being but vaguely held, was not logically followed out in detail. By others the notion was entertained without (as far as appears) any precise meaning beyond the fact, familiarly known, that diseases may and often do subside spontaneously or of their own accord, and favourably or in the restoration of health.

3. (I.) Hippocrates was a firm believer in the *vis medicatrix*, as also in the *vis conservatrix* of Nature. And either he or some one of his immediate followers spoke of the former after this fashion, namely, "our natures are our physicians." We have the equivalent of this expression in these our own days, as we shall see by and bye, in the affirmation that "the organism is its own healer." The Hippocratic maxim is nothing more than a bare expression of the fact that the powers of the living organism avail of themselves for the cure of our diseases. It explains nothing.

4. (II.) The words of David, king of Israel, in the 103rd Psalm, may next be referred to as the popular expression in his day of the curative powers of Nature, and the popular correlative of the professional *vis medicatrix*. "It is God who healeth all our diseases." That is, as we should say (speaking reverently) it is Nature, the ordinance of God, that healeth our diseases. Whatever may have been the precise idea in David's mind, we may fairly take it in a figurative sense, and regard the expression of it as of the same general import with the Hippocratic *Vis*, both expressions having their root in the fact obvious to all, and known of all, that diseases are often cured independently of Art. David, we read, "died in a good old age." We cannot but imagine that the circumstances of his reign, and the surroundings of his life, must often have required the services of his court-physicians, ordinary and extraordinary, if he had such. He was perhaps aware that their knowledge of physic and their skill as physicians were by no means great; and he may have felt that he had in fact been beholden many times when sick to another agency than theirs. It must have been matter of familiar observation to him and his subjects that when they fell ill, they got well somehow without benefit of physicians, or with small help from them. In as far, however, as they were destitute of them, they doubtless felt no want: and we may well believe that on the whole they did not fare badly, not worse probably than the refined Chinese and Japanese do in these own [illegible] under a system which we deem crude in [illegible] ey had, as these have, the mighty *vis*

medicatrix on their side; and apart from their bloody wars with the Canaanites and others, they led simpler lives than we do that enjoy the *luxury* of the medical Art. In illustration of this I may adduce the fact that among the Hindoos at the present time, nothing is more remarkable than their recuperative powers under capital operations performed on them by our countrymen in the east living among them. They recover from operations to an extent that is quite astonishing and altogether unknown in European hospitals. "God tempers the wind to the shorn lamb." And in view of what could not but be well known to him, well might David make the ascription he does in that psalm. It is of a piece with the Hippocratic maxim that "our natures are the physicians of our diseases," and it is because I regard it as such, and as the popular equivalent in those days of that maxim, and as exhibiting the popular *estimate* then formed of the relative powers of Nature and Art in the cure of disease, that I adduce it here. Widely different that estimate would seem to have been from the popular estimate of the days we live in.

5. (III.) We may next take a very comprehensive Latin aphorism or dogma. "*Medicus curat sed Natura sanat morbos.*" Who the author of it was, whether an old Roman, or a Mediæval, or a more modern writer, I have never been able to discover. I have, however, been used to think of it as Mediæval at least, if not strictly Roman, and so as finding its fitting place here in this series of lectures. Be this as it may, the dogma in itself and in its contrasts, is full of meaning; while it is admirably expressed.

6. Here, in relation to disease, are two factors introduced, the Physician and Nature. As yet in these lectures we have had mostly one of these in view—Nature, as the healer of our diseases. But now we have Art in the person of the physician brought on the stage. Here Art and Nature are brought together, and, pointedly, in the way of contrast. And the contrast drawn is to the advantage of Nature.

7. What significance there is in the selection of the verbs made use of—*sanare*, and *curare!* and what in the interjection of the conjunctive *sed!* Sanare is to heal in some real or positive sense; curare (in view of the contrast) is to care for, to watch over, to take the oversight of, to minister to, to help. In this dogma, Nature is credited, substantially or in effect, with the work, one may say the whole because the real work of healing; the physician merely with the work of nursing and aiding. We habitually speak of Nature and Art in the cure of disease; and our estimate of their relative power varies greatly among us. In this dogma, however, the rating is very precise and unequivocal. Nature is accounted the true healer of our diseases, Art as but her helper. Nature is the *pontifex maximus;* Art the curate of this high priest.

8. Further, quite apart from the difference in meaning of the two verbs sanare and curare, still greater point is given to the dogma by the introduction of the conjuctive *sed* or but. Medicus curat *sed* Natura sanat bo[illegible] [illegible] physician cures, *but* it is Nature that

[illegible] general one. It simply

gives expression to what its author believed to be a matter of fact. It gives no explanation of the fact; and it leaves us to attach what idea we please to the word Nature. Yet as to this we can have no difficulty in understanding that it means the living organism—as uninfluenced by remedies. And this dogma I accept as the true expression of a fact in Therapeutics, and as indicating the precise relation between Natural and and Applied therapeutics.

10 To come now to times less remote. The notion of a *Vis Medicatrix Naturæ* has ever had as I have said a place in the Schools; and the expression of it in these words is in use in these our own days. Let us see whether as medical science advanced, any more precise meaning came to be attached to the idea and to the expression of it than in ancient times.

11. (IV.) I may first adduce our great English physician Sydenham.—Sydenham, like Hippocrates, was a firm believer in the *Vis Medicatrix Naturæ.* He belonged to the school of Hippocrates; and in his practice he placed great reliance on the curative powers inherent in the living body. He expressly refers in terms of high praise to the Hipprocratic maxim of "Our Natures being our physicians." The author of that maxim, he remarks, "laid the solid and immovable foundation for the whole superstructure of Medicine" in the enunciation of it. He laid that foundation "when he taught us that 'our natures are the physicians of our diseases.'" And, in keeping with that maxim, Sydenham himself observes, that "Nature by

herself determines diseases, and is of herself sufficient in all things against them." By this expression "*determines*" Sydenham no doubt meant that it is through the living organism itself, and within itself, that diseases themselves originate,—in contradistinction to the notion of diseases being independent entities, introduced *ab extra* into the system; and also that it is the organism that controls them, being itself sufficient against them to bring them to a favourable issue,—save and excepting always the cases of more or less frequent occurrence, in which it is insufficient, and death carries the day. In these few words, Sydenham evinced, in my opinion, an accurate appreciation of certain fundamental facts as well in Pathology as in Therapeutics. Disease, according to Sydenham, is of the organism: and Recovery also is of the organism. Both are of it and by it and through it.

12. (V.) We may take Stahl next. In common with Hippocrates and Sydenham, he held by the *Vis Medicatrix*. He did so, however, under the name of the *Autocrateia*. With Stahl, the curative principle is an attribute of the human mind and endowed with intelligence. More particularly, he held that "the rational soul of man governs the whole economy of the body." Agreeably to his view, this rational soul discharges two distinct functions or offices,—"One, that of resisting injuries that may threaten the body,—the other, that of correcting or removing the disorders induced or arising in it." H [illegible] doctrine of a *Vis Conservatrix* as well as of a [illegible] *Naturæ*,—a doctrine Dr. Cullen remarks

which "has continued in the schools of Medicine from the most ancient times to the present." The speciality of Stahl's view was this, that these two powers, whether one and the same, or two separate powers, are powers of the intelligent or rational soul of man. Thus, for example, he held that on occasion of a poison being introduced into the stomach, "the soul, as soon as it perceives its being present, knowing the consequences, excites the stomach to throw it out" by vomiting.

13. There can be no doubt that Stahl's belief in the prevailing agency of this intelligent or rational soul, governing all the operations of the body, greatly influenced his practice in the treatment of disease. It led him to trust mainly in it, and to eschew strong or perturbative measures. He and his followers, Dr. Cullen affirms, "having been very much governed by that general principle, proposed, for the most part, only very inert and frivolous remedies,—and zealously opposed the use of some of the most efficacious, such as Opium and the Peruvian bark; while they were extremely reserved in the use of general remedies, such as bleeding, vomiting, &c."

14. It is important, however, to observe as a part of the Stahlian system, that "this system did not depend entirely upon the *autocrateia*, but also supposed a state of the body and of diseases that *admitted* of remedies; and that these remedies, although under the power and direction of the soul, *acted* upon the organization and matter of the body so as to cure its diseases."

15. This, as imparting some intelligible common sense to his notion of the *vis medicatrix*, it is necessary

to take note of. It is an admission that agents foreign to the body (remedies—drugs) taken into it, or applied to it, act on it "so as to cure its diseases," albeit acting under the guiding hand of the *autocrateia*. This idea seems identical in principle with that commonly entertained as to remedies in our own day, saving only the *autocrateia* as understood by Stahl, but embracing the *vis medicatrix* as understood by us, and in concert or cooperation with which it is believed that remedial agents do and must act.

16. I may remark, in passing, that, while himself decidedly opposed to the system of Stahl, Dr. Cullen is free to admit that as Stahl and his followers "were very intent on observing the method of Nature, so they were very attentive in observing the phenomena of diseases, and have given us in their writings many facts not to be found elsewhere." We cannot, therefore, but suppose that, with a high appreciation of the curative powers of Nature, Stahl was a diligent cultivator of the natural history of diseases, and that he attained to no inconsiderable knowledge of her ways or of her "operations," or "proceedings" (as he called them) in the school of observation; and that although he may have given us no particulars as to his knowledge, it was such as served him fairly well in the daily practice of his profession.

17. But, if, as is alleged by Cullen, he proposed for the most part only very inert and frivolous remedies, and if also he zealously opposed the use of some of the most efficacious, Stahl was nevertheless far from being a "*nihilist.*" In his "*Ars sanandi cum Expectatione*

opposita Arti sanandi nuda Expectatione" (written in opposition to a work bearing nearly the same title by Gideon Harvey) Stahl "points out in an admirable manner (Sir John Forbes remarks) the nearly equal but opposite evils derived from the system of doing *too much*." At that time, now more than a century and a half ago, whether owing to the influence of Hippocrates or not, the do-nothing system seems to have been widely prevalent. Between this and the opposite system of doing too much, Stahl interposed. In opposition to the pure or naked do-nothing Expectation, he advocated what he variously terms "*Expectatio Artificiosa*," "*Expectatio Circumspecta*," "*Ars cum recta ratione Expectandi*." And this, or these, he summarises thus: "True medical or artistic Expectation is that which, while carefully observing and watching the salutary operations of Nature, is content to do so without offering assistance where it is not needed, or limiting this assistance to the giving of prudential counsel, . . . yet, in their proper place, recognising not merely the propriety but the necessity of *artificial* interference, and yielding it accordingly; still, however, in every case, having due regard to the proceedings and cooperation of Nature, according to reason and approved experience."

18. Apart altogether from Stahl's notion of the *vis medicatrix naturæ*, setting this aside as fanciful, yet remarking that it is in a great measure made intelligible by what he says of the action of remedial agents, I will venture to say in regard to the passage just cited from his writings that it exhibits consummate wisdom;

and, further, that at this moment—now that the reign of the lancet, of calomel, and active purgation is at an end, it is coming to a great extent to be the ruling law of practice in this country, if not indeed with the aggregate of our body, yet with the most experienced and the ablest members of it.

19. And now, in conclusion, suffer me one or two remarks as to the therapeutic views I have put before you in this lecture. With exceptions, no doubt, here and there, the views in question are such as seem to have swayed the professional mind of Europe from the days of Hippocrates onwards, and until nearly the advent of Cullen. They clearly bespeak a recognition of curative powers in the living organism, and they indicate also great reliance in the practice of the profession, on the efficacy of these powers, together with a prevailing abstention from heroic remedies.

20. And in view of the actual state, and the very low estate of medical science generally, of the sciences of physiology and pathology especially, during that long period, we may well say, I think, that happy it was for mankind that the practice of medicine was then such as it seems on the whole to have been, simple, conservative, reliant on Nature.

21. From our now advanced knowledge of physiology and pathology, and our more intimate knowledge of the natural history of diseases, we may in these days be able to set forth in order the several curative processes and provisions of Nature, and in such manner as could not possibly have been done by Hippocrates, Sydenham,

Stahl and their followers. Yet it were a mistake to suppose that these processes and provisions were wholly unknown to them, or that they were entirely guided in their practice by a blind reliance on Nature. They were all of them (as Dr. Cullen testifies) close observers of Nature; and we cannot doubt that the curative ways, operations, and proceedings of the organism were in their way largely known to them. Watching at the bed-side, and watching closely and intelligently, they must have learnt to know how fevers decline, how inflammations are resolved, how hæmorrhages are stanched, &c. And this knowledge must have taught them many practical lessons of great value, and enabled them in many ways to minister effectually to their fellow men when stricken of disease and suffering from it.

LECTURE SIXTH.

The same subject continued. The views of Dr. Cullen.—Preliminary observations bearing on the state of the Profession in the United Kingdom, and on the condition of the mass of the people in respect of medical aid in the times subsequent to the Reformation in England, and particularly in the seventeenth and eighteenth centuries.

1. We have now to consider the views of Dr. Cullen on the subject before us. These, as we shall see, were decidedly opposed to those of Hippocrates, Sydenham, and Stahl.—We are now in fact on the eve of a revolution in therapeutic opinion and practice,—a revolution which, if not inaugurated by Cullen, was yet essentially promoted by him. For, it must be borne in mind, Cullen was a power in his day. He was not only the only systematic writer of high repute in this kingdom one hundred years ago, but a teacher of renown in Europe generally; and besides swaying professional opinion for a generation and more in his own day, the influence of his teaching was felt for many years after he had departed this life. Nor indeed is his candle yet gone out,—or quite gone out.

2. But before entering on his therapeutic views, it seems to me desirable that we should look about us and consider what concurrent agencies were at work

in bringing about that revolution,—and also what was the general condition of the profession,—its training, its beliefs, its usages, its practice, and its status, and what the condition of the people generally in respect of medical aid, in this country, in the times preceding the advent of Cullen, and indeed as far back as we can reach, to the time even—let us say—of the Reformation in England, but particularly during the 17th century and a large part of the 18th.—This whole field of inquiry, however, is in many respects exceedingly obscure; and I feel my footing on it insecure. I desire therefore to speak of it with reserve,—subject in fact to correction. And indeed as to much that I shall have to say, should wish it to be regarded as suggestive only,—not in any degree as authoritative.

3. It seems plain from what we can glean from the scanty records of the history of our profession, that no inconsiderable number of the more eminent physicians that practised during the whole of the seventeenth and one half at least of the eighteenth centuries,—the foremost men I mean of our large towns and Cathedral cities in England,—influenced by the teaching of Hippocrates, whose writings were familiar to them, placed great reliance on the curative powers of Nature and were simple and cautious in their practice. Yet short, comparatively, as is the time that has since elapsed, it is difficult for us to realise,—exceedingly difficult in fact to ascertain precisely, what were the habits of thought or what the usages of practice that prevailed in England—say in 1700. Since then, this United Kingdom and Europe generally have undergone

a marvellous revolution in every department of Science and Art. Yet we have nothing beyond a hazy idea of what, as regards our own profession, obtained at that time (1700) or previously to it, or obtained subsequently, until we come near to the time of Cullen and John Hunter.

4. I have said that in former days our chief physicians were cautious men,—simple in their practice and essentially conservative, yet, as we learn from the gleanings of history, there were those in these days that relied much on Art and were bold, active practitioners. They bled largely, they purged freely, they blistered smartly. Emetics they were specially partial to. They had an ample stock of drugs, and they were great adepts in polypharmacy.

5. What the popular faith in those days in physic and physicians was, we have but scant information. Yet it seems an instinct in human nature to seek for relief from suffering and to look for it in human aid. It is probable, therefore, that the common people had no inconsiderable reliance then as now on the curative powers of Art. But as to large numbers of the people in this country and over wide districts of it,—especially in Scotland, they must to a great extent have been as destitute of medical men as of roads and of many other of the conveniences of life,—and when sick left in a great measure to the unaided powers of Nature. It may be questioned whether in the '45, Prince Charles had a medical man attached to his army. He himself had, I believe, a body physician from this county of Aberdeen. But how as to his brave followers? And

how as to this, did the army of the Duke of Cumberland fare? But, indeed, the medical services of the Royal Navy and the Army were on a comparatively rude footing a century ago. Our sailors and soldiers were but indifferently served in respect of medical aid a hundred years ago. A young lad from Scotland, whose son is now a leading man in the profession, had been a couple of months in a Chemist's shop. Betaking himself to London, to push his way in the world, he was on his arrival there, laid hold of by a press-gang, and in the capacity of a common sailor sent on board a man-of-war. On its transpiring after a time that he knew something of physic, he was transferred to the surgery of the ship; and, with no higher training than I have mentioned, without ever having heard a lecture on physic or "learnt the bones," he gradually rose in the medical service, and attained I believe the rank of full surgeon in the Royal Navy! Much we may gather from a fact of this sort,—much I mean exemplifying the low state of the profession within the short period of a century.

6. A Royal College of Physicians there was two centuries ago,—that of London. But there were no medical schools; and there were very few—scarce any General Hospitals or Infirmaries in the United Kingdom.—St. Bartholomew's and St. Thomas' Hospitals indeed existed,—the former as early as 1123, the latter as early as 1553. But numerous as they now are, none of them, with the exception of these two, date further back than the last century. Even that of Edinburgh was not founded till 1736,—our own in Aberdeen not

till 1739; while that of Glasgow, now one of the largest cities in the kingdom, not until 1794. I show you here a table (compiled from Churchill's Directory), giving the date of foundation of no inconsiderable number of hospitals in England.* You will see that the oldest of them had its origin in the last century. Hereby hangs a tale as to the condition of the mass of the people in respect of our Art,—a tale also no doubt as to the state of the profession. Some generous sentiment seems to have then moved the hearts of the more fortunate members of society. But why not earlier? The Reformation first and then the Great Rebellion in England led to disastrous results in many ways. Time was needed to heal the breaches made in our social economy; and a century is but a span in the life of a nation. The state of things which followed both these events, had a chilling effect on men's minds. But indeed, apart from this, the limbs of society were for a long time thoroughly out of joint.

7. Prior to the Reformation in England, the monasteries were the medical hospitals, and the monks the general practitioners of the Kingdom; and the following graphic picture from the pen of the late Professor Blunt, of Cambridge, will serve to show how matters stood in this country as regards hospitals and the profession generally, for many hundred years, and indeed, up to

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* Westminster Hospital founded in 1715; Guy's, 1721; Birmingham, 1772-79; Birmingham, Queen's, 1841; Cambridge, Addenbroke, 1740; Chester, 1755; Exeter, 1741; Bristol, 1735, 1832; Gloucester, 1731; Hereford, 1776; Liverpool, 1739; Manchester, 1752; Leeds, 1776; Northampton, 1743; Sheffield, 1797; York, 1740.

the time of King Henry the Eighth. "Bad as the monasteries were reported to be, and bad in many instances they probably were, the event proved that they had their redeeming qualities too; and as we know not, says the proverb, 'what the well is worth till it is dry,' so was it found after the dissolution, that with all their faults, the monasteries had been the refuge for the destitute; that they had been the alms-houses, where the aged dependants of more opulent families, the decrepid servant, the decayed artificer, retired as to a home neither uncomfortable nor humiliating; that they had been the county infirmaries and dispensaries, a knowledge of medicine and of the virtues of herbs being a department of monkish learning, and a hospital, and perhaps, a laboratory, being component parts of a monkish establishment; that they had been foundling asylums, relieving the state of many orphan and outcast children, and ministering to their necessities, God's ravens in the wilderness (neither so black as they had been represented); bread and flesh in the morning, and bread and flesh in the evening; and that they had been inns for the way-faring man, who heard from afar the sound of the vesper-bell, at once inviting him to repose and devotion, and who might sing his matins with the morning star, and go on his way rejoicing" (*Sketch of the Reformation in England.* Chapter VIII).

8. This picture sufficiently indicates what the state of our profession was in this country prior to the Reformation. It was then as it had for long ages been, in the hands of the monks; and we may well believe that directly or indirectly, they were mainly guided in their

ideas by the traditions of Hippocrates, and that their practice was simple. It is the state of the profession subsequently to this and until we come to comparatively recent times that is so obscure. In the seventeenth century, trained medical men were probably to be met with almost exclusively in the large towns or cities,—men educated abroad, in Paris, the Low Countries, or Italy. The smaller towns, villages, hamlets, and vast rural districts, were many of them without benefit of regular practitioners, and the great body of the people must virtually have been left to Nature,—or to practitioners, male and female, of the lowest order every way. And indeed we learn on undoubted authority that even in England—nay in London even, no small number of the practitioners were of the rudest description. Barbers many of them were, farriers, butchers, blacksmiths, and such like. And these, together with old women reputed sagacious and skilled, would seem to have been the "general practitioners" all over the Kingdom. But, indeed, during some part of the sixteenth century (if not also a part of the seventeenth), even after the Reformation, the Church of England in many parts of the country, was not much better served—mechanics, artificers, farmers, grooms, and people generally of the baser sort, being admitted to benefices (Blunt). Even the Apothecaries' Act of 1815, tells a tale as to the kind of men that were entrusted with the health and lives of the community in England and Wales up to that time. The elevation that has taken place in the education and in the status of the persons licensed by the Worshipful Society of Apothecaries, and the high terms of praise in which the efforts of that body to train its licentiates have been spoken of, sufficiently evince by way of contrast the low condition of the profession in the last century in England and Wales. In Scotland, outside Edinburgh matters were probably no better.—With exceptions here and there, the state of the profession was everywhere low indeed. But, indeed, the medical sciences as we now have them are in great part the product of the century now current. It was said of Cullen by Dr. Bostock, that he did more than any of his contemporaries to sweep away the *rubbish* of antiquity. This he certainly did; and in doing it he rendered a signal service to the profession. Opinions will differ as to whether Cullen contributed much directly to the advancement of medical science and practice. He was an accurate and a shrewd observer, rivalling even Sydendam, and he gave us descriptions of diseases more true to Nature than any or almost any of his predecesssors. His Physiology is a thing of the past; and the like may be said of his Pathology—or of most of it. —As to his Therapeutic views, I shall have occasion to speak presently. His services, however, in the direction indicated by Bostock,—services which paved the way to real progress in our science, deserve to be had in remembrance.

9. Hitherto, I have been speaking of the state of our profession chiefly as it existed in the 17th and earlier part of the 18th centuries. We have, as we have seen, very scanty data of a historical kind to go upon relative thereto. But what has been said may serve to shew that it was at a low ebb. The question however

specially before us is, whether as a rule the practice pursued in those days was active or the reverse,—more reliant on Nature or more reliant on Art. It is not easy to speak positively as to this. As to internal remedies of a constitutional order—deobstruant and such like,—they were of a multifarious kind, and the combinations made of them exceedingly composite and heterogeneous. They comprised among others familiarly known, such things as snails, the web of the spider, the powder of dead men's skulls, men's own urine, besides an infinity of herbs. In view of these we cannot but think that the practice followed was largely futile or feeble. Not so, however, as regards *evacuants* of all kinds,—bleeding, purging, &c. As for these,—lowering measures,—the practice of some was no doubt vigorous enough. Lieutaud (Cullen tell us) mentions a physician who bled a patient (who died) one hundred times in a single year:—Lieutaud himself (Cullen adds) narrating the fact without horror. Traces of this practice of general blood-letting as a traditionary thing,—in the spring and fall of the year, are still to be met with in some rural districts, or were until (so to speak) the other day.

10. We have seen that for a long time and up to some period towards even the middle of the last century the views of Hipprocrates and others of his school held sway,—the practice followed being on the whole mild and reliant on Nature. And yet it is certain that somehow,—and at one time or another, a change came over the spirit of the profession. For by the beginning

of the present century, if not earlier, a system of active treatment had come to prevail,—a system which even gained force during the first quarter of the century.

11. That a change had in fact come over the profession since the days of Sydenham clearly appears from the whole tone and tenour of Sir John Forbes' work. But for that change the work in question would probably never have been written. The controversy, too, for some time carried on thirty years ago between Dr. Alison, Dr. Hughes Bennett and others on the subject of general blood-letting in inflammatory diseases and the question then raised as to whether these affections had not undergone a *change of type* in the earlier part of the century, may be adduced in support of what has now been alleged.

12. What if in this country, the great physician I am about to refer to, and have already often named, to wit, Dr. Cullen, contributed largely to create and to foster that change in therapeutic opinion and practice? And what if, in England specially, the Apothecaries' Act of 1815 mainly did the rest? Under that Act there prevailed for many years a system whereby the general practitioners of England and Wales could only earn their bread by the dispensing of drugs. That system although modified more than forty years ago by Lord Tenterden's famous decision, and, still more, by the Medical Act of 1858, still holds its ground; and the sixty years it has done so cannot but have essentially tended to enhance the professional and also the popular belief in the efficacy of drugs and the great power of Art.

13. Other concurrent and cooperating causes there doubtless were. The great European war—the wars with the first Napoleon raised up a body of highly intelligent and strong-minded and active surgeons, and these undoubtedly contributed to it. Even the works of Dr. Hamilton on Purgatives, of Dr. Gordon, Dr. Armstrong, Mr. Hey and others, on the efficacy of general blood-letting in Puerperal fever, and of Dr. Welsh and others on its efficacy even in Typhus, together with the teaching and the practice of Dr. James Gregory, Dr. Abercrombie, Dr. Mackintosh, and many others, in regard to the almost essential importance of blood-letting and calomel and purging and blistering in inflammatory, apoplectic and other disorders may have helped on the system of active practice,—have added to the faith in physic, and derogated from reliance on the curative powers of the living organism.

14. But indeed from the beginning of the present century,—nay, from the beginning of the last quarter of the century preceding, a general spirit of activity in Science and Art was abroad. The 17th century and a large part of the 18th were in many respects dead times. But the discovery of Oxygen by Priestly in 1774 gave a great impulse to scientific research, as did also, later on (1781) the discovery of Hydrogen and of the composition of Water by Cavendish, and of the nature of Potassium and Sodium (1807) by Davy, &c. Medicine participited in that spirit and John Hunter and Bichat were among the foremost pioneers in the search after truth in our science, and in the progress of Medicine as an Art.

LECTURE SEVENTH.

The same subject continued.—The views of Dr. Cullen. These in a great measure opposed to those of Hippocrates, Sydenham, aud Stahl.—Remarks on his views.—Cullen's "memorable" injunction in the treatment of disease—"to obviate the tendency to death." Incomparable value of this injunction. Reference to the Apothecaries' Act of 1815.

1. What now were the views as to the curative powers of Nature put forth by Dr. Cullen a hundred years ago? He admitted the existence and the agency of a curative power in the living body. Yet it is clear that, in marked contrast to Hippocrates and Sydenham, he had but little favour or affection for it. "Although (he remarks) the *Vis Medicatrix Naturæ* must unavoidably be received as a fact, yet wherever it is admitted, it throws an obscurity on our system, and it is only where the impotence of our Art is very manifest and considerable that we ought to admit of it in practice." And again: "In whatever manner we may explain what have been called the operations of Nature, it appears to me that the general doctrine of *Nature curing diseases*,—the so-much vaunted *Hippocratic* method of curing, has often had a very baneful influence on the practice of physic as either leading physicians into or continuing them in a weak and feeble practice, and at the same time superseding or dis-

couraging all the attempts of Art."......"Even in the hands of Sydenham it had this effect." And he adds, that "Although it may sometimes avoid the mischiefs of bold and rash practitioners, yet it certainly produces that caution and timidity which have ever opposed the introduction of new and efficient remedies." And he instances Antimony and the Peruvian bark. (Cullen's Works by Thomson. Vol. I.)

2. How strikingly the views expressed in these several quotations contrast with those of Hippocrates and Sydenham! It is difficult to understand how a man so sagacious and so well informed, and with the great experience he had, should have expressed himself so strongly. But it is easy to see how in the peculiar position he occupied, as (virtually) the only teacher of medicine in the Kingdom, and with the influence he so long exerted in days when men were more guided by authority than they now are, he should have helped greatly to bring about the revolution in therapeutic opinion and practice which held sway from his time till about the end of the first thirty years of the present century,—and which, although in an abated form, still prevails among the aggregate of our body.

3. Cullen admits the existence of the *Vis Medicatrix*; and here and there in his writings he brings it into view as an agency to be taken into account in explaining the phenomena or the cure of diseases. He speaks of it as "an effort of Nature of a salutary tendency," and as to this, in conection with Fever, he says: "In every fever which has its full course, there is an effort of Nature of a salutary tendency." As such he regarded

the state of *Febrile Reaction.* He looked upon it as a provision whereby the heart is excited to resist the effects of the causes operating injuriously on the system, depressing its actions generally—as evinced in the cold stage of fever. But it is plain that he had not that firm reliance on the efforts of Nature that Sydenham had. And indeed in laying down the treatment of Idiopathic fever, he observes, that "the operations of Nature are not so well understood as to enable us to regulate them properly, and so make them the basis of our indications of treatment" (*First Lines*, Book I, Chap. VI). It is difficult to make out what it is that he precisely means by this. Surely in fever, the salutary operations of Nature resolve themselves in the main into the Febrile Reaction, which Cullen regarded as such, and for the rest into the sustaining power of the general *Vis Vitæ*,—and specially that of the Heart. Now, the character of both of these may be judged of by the temperature of the surface and the state of the pulse, and in simple (uncomplicated) cases, it is by the condition of these that we are guided in the treatment of fever,—moderating the reaction if excessive, promoting it if defective—the skin unduly cool and the pulse feeble. Accordingly, in my opinion at least, the salutary operations of Nature in that disease are sufficiently well understood to enable us to make them one basis and the main basis of our treatment. In making the statement he does, perhaps Cullen had in his mind some vague, ill-defined idea of the "operations" referred to arising out of the expression itself,— or out of the scholastic form of it, *Vis Medica-*

trix. But if he missed his mark, here, as I think he did, Cullen nevertheless, as we shall presently see, hit the nail on the head in otherwise laying down the indications of treatment in fever,—not really altering the footing of the thing but placing it on a more tangible or obvious ground.

4. To return. The *Vis Medicatrix*, Cullen says, we must unavoidably receive as a fact. We cannot help doing so. Yet it is only where the impotence of Art is very manifest and considerable that we ought to admit of it in practice. Why so? Because, he says, wherever it is admitted it throws an *obscurity* on our (therapeutic) system. Unquestionably it does and it ever will. For it is the inseparable cooperation of that *Vis* with our Art that makes it so difficult to judge of the efficacy of "our system." But why should exception be taken to it on that ground? The question is,—is it a fact? That it is a fact he admits. Yet it is only where he cannot dispense with it that he would take account of it in practice! If we substitute for "our" system, *his* system, his objection to it will be intelligible. But what would Cullen have said, had he lived to see it done, in view of Pneumonia being treated, and successfully treated, under three widely different and indeed opposite systems, so successfully as would have made it impossible even for him to determine which is the best? Would not the introduction of the *Vis Medicatrix* have tided him over that *obscurity*,—have helped him to explain the equality of the results? For, on no other footing can we account for that equality. In the case of a broken bone, the agency of that power must needs be admitted.

Why not in a case of Pneumonia? Fully allowing that Sydenham and his followers relied too exclusively on that power; and that Cullen had warrant enough for much of his criticism of their system, it is yet somewhat difficult to understand how with his great acumen he should have come to oppose it so strongly,—should have gone the length of virtually discrediting "God's best gift to man" in respect of disease.

5. Dr Cullen indeed observes that "from a comparison of Physiology and Pathology, we know the several changes that are necessary to be made for restoring the body from a morbid to a healthy state." This might be regarded as indicating in his view the changes necessary to be made by the living organism itself uninfluenced by "our system" from the one state to the other. If so, it would be as ample a recognition of the operations of Nature as one could desire to have. Possibly, however, he held that the changes in question although occurring within the organism (*e.g.* the absorption of serum, lymph, pus, &c.,) are not effected otherwise than by the curative action of remedies. Perhaps, if the truth could be ascertained, there may have been some confusion of ideas on this fundamental point in Cullen's own mind. One thing, however, is clear,—to wit, his low appreciation of the curative powers of Nature,—his high appreciation of those of Art.—

6. Erring here, as we believe he did, it must yet be allowed that in the department of applied therapeutics we are deeply beholden to Dr. Cullen. We owe to him that injunction in the treatment of diseases, long called

his "*memorable*" injunction,—namely, "to obviate the tendency to death." Speaking of the treatment of Idiopathic fever, he says—"The plan which appears to me most suitable, is that which forms the indications of cure upon the view of obviating the tendency to death." (*First Lines*, Book I, Chap. VI). Was it his idea that if that tendency can be but successfully met by Art, the "salutary operations of Nature" will then complete the cure? Or this, that tendency obviated, the operations of Art will then avail to effect the *positive* cure of the disease? From the general tenour of his views, one would suppose the latter. And yet it might be doing an injustice to his memory to imagine this.

7. But however this may have been, we owe to Dr. Cullen that injunction as a guiding principle in the treatment of disease. His enunciation of it was the broad foundation laid of a principle of the most vital importance in therapeutics. No doubt the idea was not new to him. But it came to be stated by him, one may say, with *emphasis*, and we cannot but regard it as a positive—indeed an invaluable gain in therapeutics. If the idea was not strictly new to him, it was yet as good as new; and it may be said to have become with the profession "a household word."

8. Since Cullen gave us that injunction, great advances have been made in our knowledge of the Modes of Dying. For this we are specially beholden to Bichat. He was the first to investigate this important subject fully; and although he did not exhaust it so as to leave nothing further to be desired in a scientific sense, he yet attained to a wonderful degree of accuracy and com-

pleteness in the knowledge and exposition of it. All or most of the terms he made use of in speaking of it are in use to this day. In this country, while we owe to Sir James Kay Shuttleworth, Dr Charles J. B. Williams, Dr. John Reid, and others the additions to our knowledge of it, Dr. Alison unquestionably most of all contributed to illustrate and enforce the application of that knowledge in the treatment of diseases. "The Fatal Terminations" of the several kinds of morbid action as well as of individual diseases, held a prominent place in his clinical teaching as they do in his systematic writings —and always with a view to the means of obviating them.

9 This injunction of Dr. Cullen I here take note of as a land-mark in the progress of therapeutics, as a substantial product and an invaluable gain in the evolution of our subject. It will never sink into oblivion. On the contrary, it will evermore stand out to view as an important advance in our Art, in relation to certain *accidents* (for such they may be regarded) to which diseases are liable while running their natural course, and the "obviating" of which leaves the *Vis Medicatrix* free to bring them to "a favourable termination."

10. I have referred to the Apothecaries' Act of 1815 as having contributed powerfully to the active practice pursued in this country during the time that has since elapsed until, so far, of late years. This Act, in its bearings on the therapeutic views of the profession and its practice opens up a large and an exceedingly interesting field of inquiry. Its influence, national in fact,

must have been very great. Evil in its consequences the late Dr. Latham (writing however thirty years ago) regarded it; and he deeply regretted that the Royal College of Physicians of London should have rejected the overtures made to it by the Government of the day, to take the general practitioners of England and Wales under its wing. In my previous lecture, I referred to the fact that under this Act, the practitioners in question could only earn their bread by the making up and sending out of drugs,—for which and not for their attendance or advice they were paid. What the results of such a system on the minds of those living under it, and many thousands they were, I need not dwell upon—even were I competent to do so. Modified the system was forty years ago by a decision of the late Lord Tenterden,—yet perhaps more in name than in reality. More recently (1858), it has been still further modified by the Medical Act. It is to be hoped that the system will ere long be entirely done away with, and that the articles of the Materia Medica will be exhibited only in so far forth as may be needful for the cure of disease.

LECTURE EIGHTH.

The same subject continued. The views of M. Gubler, Professor of Therapeutics in the School af Medicine in Paris. Antagonistic to those of Cullen but in harmony with those of Hippocrates and Sydenham.

1. In continuation of this outline of the views that have prevailed in the schools, as to the nature of the curative powers inherent in the living body, I shall now advert to those put forth within the last few years by M. Gubler, of Paris, the distinguished Professor of Therapeutics in the *Ecole de Médecine.*

2. Very important these views are. Important they are in themselves,—important also in relation to the whole subject of this course of lectures. They are in thorough accordance, as we shall see, with those of Dr. Alison and Sir John Forbes, and in expression also with the Latin aphorism already commented on. Indeed, nothing can well be happier in thought and in expression than what M. Gubler has given us in the Preface to his *Commentaires Thérapeutiques*, published in 1868.

3. L'Organisme se guérit lui-même : Le Médecin ne fait que le placer dans des conditions favorables au retour d'un mode de fonctionnement régulier." In these words we have the exact parallel of *Medicus curat, sed Natura sanat morbos.* The diseased organism, he

affirms, is its own healer; the organism when diseased heals itself. This (apart from that aphorism) is, perhaps, the strongest affirmation we have yet met with in this review of the curative powers of Nature. L'Organisme se guérit lui-même. No question is here raised as to the *relative* powers of Nature and Art. Nature is alleged to be the sole—the only healer. This affirmation Alison would have accepted and made it the first great truth or law in therapeutics;—for he virtually and in effect inculcates it again and again in his writings,—only perhaps not so trenchantly. And Sir John Forbes has given expression to the very same idea.

4. Then as to the physician,—or as to our materia medica,—as to Art in short, what of him or them? According to M. Gubler, the physician does nothing more than place the organism in a condition conducive to its return to the state of health. As his first proposition accords with the *Natura sanat* of the aphorism, so does this other with the *Medicus curat*, coupled with the disjunctive conjunction *sed* or but.

5. Commentary on these bright, clear, incisive utterances of M. Gubler is really unnecessary. Yet one may dwell on them a little,—looking at them from this side and that,—turning them over this way and that in the mind, in order to lodge them the deeper there. It is the organism, he tells us, that heals itself—that is its own healer. It is not the physician; it is not our drugs or other remedial agents. It is not Art. The restoration to health of the diseased organism is the work of Nature, and of Nature alone. All that the physician does or can do is, to place the suffering man, his

patient, in circumstances favourable to his getting well. And this he does, on the one hand,—and very particularly—by having a steady eye to Cullen's injunction in the matter of death, and, on the other, by aiding in every way he can the provisions of Nature for the spontaneous decline or cure of the disease his patient is labouring under. His main concern all through will be to watch for indications of impending danger and to meet these as they arise. His chief anxiety about his patient will lie here. Danger averted,—death warded off, he knows, if he believes in Gubler, that all will be well. Yet he may lend a helping hand to the organism still further—or in other and many ways.

6. All this is implied in what M. Gubler says of the physician. What is remarkable in what he says of Nature's share in the ministry of Healing is—the *unconditioned absoluteness* of his allegation. "L'Organisme se guérit lui-même." There is, moreover, a taking off, as it were, of the physician in the negative way he speaks of him in contrast with the curative power of the organism. "Il *ne* fait *que*." He does nothing more *than*. He is the humble servant of the *Vis Medicatrix*.

7. Nevertheless, it must not be imagined that M. Gubler seeks to disparage the physician and his work. So long as the physician can save life, and so long as he can render, as he may, manifold services to the sick, so long will his services be in request,—so long will he be a benefactor to his kind and worthy of all honour.

8. What M. Gubler says is a singularly happy rendering in French of our Latin aphorism. And what if

both be the expression of the truth of things, in relation to disease and the cure of it? If so, what importance it imparts to the study of natural therapeutics and of the natural history of diseases! How it furnishes an answer (as regards the main issue involved) to Sir William Hamilton's famous question—"Has medicine made a single step since Hippocrates." In one sense, and the chief sense it has not. Yet as regards the "il ne fait que" of the physician,—as regards the saving of human life and the relief generally of human suffering, it has in many different ways made great strides. Further, if M. Gubler's position be sound, one may see clearly that it is from overlooking it that most of our illusions in the department of therapeutics spring,—how it is that our malcontents speak of that science as they do. Too much is ignorantly claimed for Art. And thus, while Nature is the real healer, two diametrically opposite remedies, or systems of treatment, may each of them have the most confident claims advanced in its behalf,—and on the supposed sure ground of experience.

9. What M. Gubler says *is* true. And God be thanked that it is so. Were it otherwise,—were mankind directly beholden to our Art for the cure of disease, sad were our lot; sad it would be for the earlier patients of even the most distinguished of our young physicians and surgeons, and until experience had given them adequate skill. And the fact that his position is a sound one is a comforting consideration for one who feels strongly, as I do, the neglect of the study of natural therapeutics. The profession will continue to differ and to dispute about remedies and cures,

and to appeal confidently to the criterion of experience. But Nature will continue to hold her ground, and (laughing in her sleeve) to cure even under the most opposite kinds of treatment,—and as regards many diseases with results that shall be inappreciably identical—statistically the same! In inflammatory diseases, Dr. Abercrombie bled freely. Dr. Todd spared the blood and poured in wine and brandy. Dr. Hughes Bennett gave his patients beef-tea and neither bled nor brandied. Dr. Cullen says (as we have seen) that wherever the *Vis Medicatrix* is admitted, it throws an obscurity on our system. In the case just now in view, does it not rather throw light upon it, and enable us to understand how under systems so opposite, the results should be so satisfactory. The essential factor here is surely the *Vis Medicatrix*,—the organism "qui se guérit lui-meme."

10. But I am not yet done with M. Gubler. Let us now follow him one step and an important step further. In connection with the "il ne fait que" of the physician, we have to consider what he says as to the *mode of action* of remedial agents.

11. In unfolding the action of individual remedies—drugs—as they come before him in their order in his *Commentaires Thérapeutiques*, his aim, he says, will be to give an exposition of the physiological actions and the therapeutic uses of each. He contrasts these two expressions—*actions* and *uses*. And he does so, he says, of set purpose,—the distinction in question lying in his view at the root of all sound therapeutic teaching.

12. Let me try to make it clear to you what he means, and the rather because with him these two contrasted expressions are all in all. In what we call drugs, we have nothing to consider (he says) in the way of scientific investigation, save their physiological actions; and in respect of these actions, we have to look at them, simply, as *modifiers* of organs or of the action of organs, inducing, as modifiers, certain changes in the organs. Their physiological actions ascertained, then, in relation to disease, we have simply to consider the remedial applications or the uses to which that knowledge may be turned. Opium induces sleep: opium may be turned to account in cases of disease attended with wakefulness. Further, and very particularly, according to M. Gubler, drugs act on the living organism in the same way in disease as in health. They have not one action or one kind of action in health and another action or kind of action in disease. It is precisely the same in both. Their therapeutic use is but an application of their ascertained physiological action to the circumstances or the conditions of the organism when diseased or as diseased.

13. Accordingly, with M. Gubler, drugs—remedies—are in no proper sense *antagonisers* of disease or of morbid actions. They are only *modifiers* of it. As such they come in aid, and in aid only of the organism which is its own healer,—lending it a helping hand,—tiding it over a difficulty,—even lifting it sometimes out of the horrible pit of death—if impending.

14. But, to understand M. Gubler aright, it is neces-

sary to remark that with him diseases are not "*entities.*" The popular notion is that they are such,—specific things, natural history objects, so to speak, like worms, which have got into the system somehow and have in some way to be expurgated from it. And with not a few medical men, the same or a like idea obtains. But for that idea, the word *Anti*, so constantly on our lips, would never have found its way into our professional discourse. Anti-phlogistic, anti-spasmodic, anti-periodic, anti-syphilitic are expressions in daily use; and they convey the notion of a direct, specific counteractive to a specific morbid entity.

15. Let us now follow M. Gubler still another step further, albeit simply in illustration of the foregoing.

First. In illustration of the position just now before us, he says:—It is an error to suppose that *Anti-spasmodics*, for example, are inert, or passive, or devoid of power when administered to a person *free* of spasm; and that their power is developed only, or only comes into play, when administered to a person labouring under spasm, encountering in their transit through the system that morbid condition which we call "spasm." In the state of health, he affirms, these so-called anti-spasmodics (whether they act as stimulants or as sedatives) excite or abate (as may happen) the nervous actions of the system, sensific and motor; and they do so precisely in the very same way and to the very same extent as when these nervous actions have the character of spasmodic. Spasm or no spasm, it is all the same. The only difference is, that in the one case there is a spasm present which has to be influenced or modified,—in the other, there is none. Still, the action exerted on the motor or the sensory nerves or on both by the agent employed,—by the anti-spasmodic, is the same in both cases. And the action in question may not or will not be apparent in the one case, simply because there is no spasm to be "cured;" while in the other, if the remedy has beneficially *modified* the affected organ, the action exerted by it may be apparent only in and through and by the subsidence of the spasm. But whatever its mode or its kind, the action of the anti-spasmodic is the same in both, spasm present or spasm absent.

Secondly. There is in truth (M. Gubler maintains) no such thing as *therapeutic virtues* in anything. And yet we constantly speak as if there were. We speak of the therapeutic virtues of opium, of mercury, of bromide of potassium, &c. The alleviation or the cessation of a disease is not the result of a struggle or a conflict (*battle*) between it and its remedy, *i.e.*, of an agent capable of directly *counteracting* it, as happens when an acid meets an alkali and neutralizes it, or when water is poured on a fire and extinguishes it. The beneficial result comes simply of a change or of changes wrought (he says) in the chemical composition or in the plastic constitution, or in the functions or structures of the organism, by the agent had recourse to,—changes by the instrumentality of which, or by the aid of which, the system "recovers its *disturbed equilibrium*" (M. Gubler's general expression for disease), provided always (he observes) "it retains in their integrity its nutrient and its plastic powers,—or rather (he says) its *formative* powers—the essential attribute of living beings." By this he obviously means the essential conditions of vitality, or the conditions by which life is maintained. This general observation is wide enough to embrace what relates to the occasional tendency of diseases (intrinsically curable) to an unfavourable termination,—a tendency which may be successfully met by Art; and it comes within the scope of his "il ne fait que" in respect of the physician. It is here especially that this comes into view. The physician obviates the tendency to death; and then the organism which is its own healer comes into play and completes the cure. Perhaps this was in M. Gubler's own eye. If so, he is in the most complete accordance, as we shall see in my next lecture, with Dr. Alison in his therapeutic views.

16. Let me now put before you one or two pithy words of his—in keeping with those now commented on. In opposition to the notion of disease being a foreign importation—a specific entity, and of cure implying a direct counter-active of it, he says:—" C'est l'organisme qui se change lui-même," in passing from health to disease, and in repassing from disease to health. And again, having an immediate eye to the physician:—"L'Organisme se guérit lui-même, avec notre aide." Yet, alas! "Il court souvent a sa perte, malgré nous," —do what we will or may to ward off a fatal issue.

LECTURE NINTH.

The same subject continued. The views of Professor Alison. These identical in substance and in expression with those of M. Gubler.

1. Let us now consider the teaching on the great subject before us of the late Professor Alison. In the order of time, he should have had precedence of M. Gubler. But it seemed to me that the prior exposition of the views entertained by the latter, would greatly facilitate the understanding of those given expression to by Alison. What is remarkable is, that the views both of Alison and Gubler are identical,—identical in substance—identical even in expression. And yet it is not improbable that Gubler had no knowledge of what Alison had written on the subject, a consideration this of real importance.

2. Called by acclamation and without a contest in 1843, to fill the chair formerly occupied by Dr. Cullen, in the University of Edinburgh, Dr. Alison was (as far as known to me) the next after Cullen to give any formal deliverance on the subject before us. And singular it is that his attention had somehow been specially drawn to it even in his student-days. For his thesis, on occasion of his graduating M.D., in 1811, was "*De Viribus Naturæ Medicatricibus.*" In this thesis he adduced in brief all that had been advanced concerning

these powers from the days of Hippocrates downwards. In it, too, and as indirectly forming a part of his subject, he brings in Cullen's famous injunction. And in his *Outlines of Pathology and Practice of Medicine*, published in 1844, he brings prominently into view as well the Modes of Dying as the Modes of Healing.

3. Like the author of the Latin apothegm quoted and commented on in a former Lecture, and in common also with M. Gubler, Dr. Alison does not treat of the "*Natura Sanat*" in the abstract. Like them, he takes in also the "*Medicus Curat*"—if I may so express myself. In many parts of the Outlines, and in connection with individual diseases, or different kinds of morbid action, he exhibits in detail the curative provisions of Nature. Yet, apart from a chapter in which he gives a brief general view of the modes in which "the tendency of most diseases, both acute and chronic, to a spontaneous favourable termination is accomplished," it is chiefly from what he says of the "*Medicus Curat*" that we gather his views as to the agency of Nature in the cure of disease. Still, one abstract statement he does make in regard to the nature of that curative power. Admitting the existence and the agency of the *Vis Medicatrix*, not grudgingly or of necessity as Cullen did, but of a ready mind, he yet formally repudiates the notion of its being a *special* power or one *sui generis*. He holds it to be none other than the ordinary vital powers whereby Life is sustained and Health maintained. It is by these powers that disease is induced, that it subsides of its own accord, that the

products of morbid action are removed or rendered harmless, and that health is restored. Referring to the fact that the circumstance (so often and so distinctly observed) of most diseases having a tendency to a spontaneous favourable termination, had suggested the doctrine of a *Vis Naturæ Medicatrix*, constantly resident in the living body, he yet takes exception to the term. "This term (he says) is decidedly objectionable, as implying either mere fanciful speculation, or the substitution of the final for the physical cause of changes observed in the body." This caveat, however, allowed for, he goes on at once to remark—"But it is of the *highest importance* both to *know the fact*, and to *understand the modes* of such salutary changes gradually and spontaneously taking place in the course of diseases." (*Outlines*, p. 43).

4. His formal utterances on the general subject are to this effect:—With the exception of a very few drugs, three, four, or five out of the many hundred that have a place in the Pharmacopœia, which "cure" we know not how, and which we therefore call *specifics*,—all our drugs—our remedial appliances of every kind, in diseases that admit of cure, are "auxiliary only to the provisions of Nature for the spontaneous cure of diseases," or for "the spontaneous decline of diseases."

5. Auxiliary! This is a humble position surely to assign to our *Materia Medica!* while it betokens a high appreciation of the *Vis Medicatrix*, the paramount agency of which it implies. It tallies, too, very precisely, with what M. Gubler and the Latin aphorism affirm, of the physician. It does not tally, however, I apprehend,

with the popular belief. This belief assumes that drugs have a direct,—a specific power over morbid processes and the products of these.

6. Dr. Alison denies this, or he allows it only (as already remarked) in respect of a very few drugs which he names,—such as quinine in ague, colchicum in gout, mercury in syphilis. But even as regards these, it is only in the present state of our knowledge and therefore provisionally, that he is content to call them specifics. "The beneficial action of all other remedies is only auxiliary," only "subservient;" and he further affirms that "they have no specific power" over morbid actions, and further still, that they are "incapable of arresting the course of morbid actions." These are certainly strong affirmations; but they are in perfect keeping with those of M. Gubler. Our remedial agents are declared to be destitute of any specific power over disease; and in respect of their beneficial action to be auxiliary or subservient to something else.

7. Auxiliary to what? His answer to this, repeated twice in the same chapter, is, that they are so to the *provisions* of Nature for the spontaneous *decline* or the spontaneous *cure* of diseases. (*Outlines*, pp. 76, 78).

8. Here, let me observe, we have somewhat of a duplex affirmation: one, a spontaneous decline or cure; the other, provisions of Nature for that end.

9. I have, I hope, no love for hair-splitting. Yet in the laying down of foundation principles, and especially in respect of a subject like this regarding which no little misconception prevails, precision of language is desirable. Here, then, we have the assertion that in

those diseases that admit of cure, two facts obtain,—*first*, a spontaneous decline or cure of the morbid actions; and, *secondly*, provisions within the organism whereby that spontaneous decline or cure is promoted or brought about.

10. The two expressions "decline" and "cure" are not indeed exactly synonymous. Cure is not exactly the equivalent of decline, although it implies this. A fever (typhus for example) after a time spontaneously declines: it runs its full course and then subsides—recovery following. Here we have simply the decline, the cessation of the morbid actions. Alison's "spontaneous cure," on the other hand, seems, in addition to decline, to link itself to what he calls "provisions of Nature" for its accomplishment. A pneumonia or a pleurisy, for example, spontaneously declines as a fever does; but in both there are exudation-products to be removed or disposed of. It is here that the expression *cure* is specially applicable, and that, too, in connection with the expression "provisions of Nature."

11. What these provisions are, which vary greatly in different diseases, we shall afterwards have occasion specially to point out and consider in connection with the natural Modes of Healing. Meanwhile it may be remarked that this word "provisions" is Dr. Alison's general expression, in part, of his idea of the *Vis Medicatrix,* and the equivalent of Dr. Cullen's "salutary operations of Nature," or "efforts of Nature of a salutary kind."

12. To recapitulate:

(i) The *Vis Medicatrix Naturæ* (albeit the name given to the facts included under it is objectionable) is a real and an efficient power inherent in the living organism for the cure of disease. But it is not a special power or one *sui generis*, nor yet a single power. It is simply the ordinary vital powers by which we live and move and have our being.

(ii) Accordingly, diseases that are inherently curable, have a spontaneous tendency to a favourable termination; while there are provisions in the organism for bringing about that termination and the restoration of health.

(iii) Remedial agents, such as the articles of the Materia Medica, have no direct, still less any specific power (two or three exceptions allowed for) over morbid actions.

(iv) Their remedial action is auxiliary only, subservient only, to the spontaneous decline and cure of diseases, and to the provisions of Nature for effecting that decline and cure.

13. Let us now follow Dr. Alison a step further. Auxiliary only in respect of their beneficial action, how in his view do remedial agents act? Here also we shall find him in entire accord with M. Gubler. It is not by any specific power they exert, for they are devoid of any such power. Moreover, they are incapable of arresting the course of morbid actions. And this, as we shall hereafter see, is in keeping with Dr. Bristowe's views recently published (1878). How then?

14. In this way, " They can frequently *modify* these

morbid actions (he tells us) and *counteract* those changes which in the circumstances of individual diseases are most immediately *dangerous to life.* We can have no doubt that in this way they frequently save life; and, generally, when prudently used, they place the body in circumstances more favourable to the spontaneous decline of diseases." (*Outlines*, p. 78). This is almost a literal rendering of M. Gubler's words.

16. All that Alison claims for remedial agents is—power to modify morbid actions, and in such a way as either to aid or promote the provisions of Nature for their spontaneous decline and cure, or, else to counteract such changes occurring during the incumbency of the morbid actions as may be fraught with danger to life. On the one hand, they act so as to obviate the tendency to death, and they are exhibited with that view; or, on the other, they so act as to place the body in circumstances favourable to the spontaneous decline of diseases.

17. And it will be seen, I think, that I am right in assuming, as I have done throughout, that a system of therapeutics that shall be worth anything should be reared on that duplex foundation—the Modes of Healing as occurring spontaneously, and the Modes of Dying as resulting naturally from disease.

18. But I have not yet exhausted Dr. Alison's teaching. One other piece of doctrine has yet to be brought into view, and one identical also with Gubler's teaching. The only power our remedial agents exert is, he says, that of *modifying* morbid actions. But how? By

an influence, he tells us, exerted by them on the living body during its *diseased* states which we believe to be capable of *explanation* by what we know of the operation of these same agents on the *healthy* body. (*Ibid.* p. 79).

19. This is a cardinal position, and note must be taken of it as such. The influence they exert on the morbid actions, or on the body generally in its diseased states, is *identical* with that exerted by them on these actions or on the body generally in its healthy state. They have not one kind of action in health and another and a different kind of action in disease. It is the same in both. This although at variance with popular belief, and even with much of professional belief, is, I apprehend, the truth; and it is important that it should be clearly understood. Assuming it to be true, Dr. Alison remarks in connection with it as follows;—"This makes it necessary to inquire into the real nature of the change which a remedy can effect on the body, that is, as to its mode of operation. And this requires our inquiring into what has been called its *physiological* action, or the mode in which it affects the *healthy* body. The knowledge of its physiological action, compared with our knowledge of morbid actions themselves, and when we have reason to believe that these morbid actions are of *such a nature* as to *admit* of being directly or indirectly modified by the remedy, will often enable us to draw an *inference*, with more or less confidence, as to its *real* efficacy in averting morbid changes, or successfully counteracting them, or in promoting their favourable termination." (*Ibid.* p. 77, *et passim*).

20. All through he will be found harping on these two leading strings—Death and Recovery, the Modes of Dying and the means of counteracting them, and the Modes of Healing and the means of aiding them.

21. So much for Dr. Alison's general views. The last of them—the virtual *identity* of action of remedies in disease as in health, is perhaps that which may not be so readily apprehended as the others. Yet it is important that it should be clearly understood, for it is fundamentally important as a principle in applied therapeutics. And as to this identity of action he expresses himself as follows: "In regard to each class of remedies (in treating of them in their order) we state *first*, the effects observed from them on the *healthy* body, and the mode of their action when that is referable to any more general principle; and, *next*, the general *inferences* which thence arise for their *application* in disease." (*Heads of Lectures on Institutes of Medicine*). There is no mention here of therapeutic actions or of therapeutic virtues. There is mention only of the application to disease of the known physiological action of remedies, that is, of their action on the healthy body. M. Gubler, as we have seen, makes much of this, insisting strongly upon it as a fundamental principle in therapeutics.

22. I may just observe in conclusion that not in this particular only but in every other, Gubler and Alison are at one. Nor can we doubt that the latter, were he now alive, would cordially acquiesce in Gubler's pointed affirmations as to the relative positions of the organism and the physician. In my next lecture, we

shall find that we have Sir John Forbes a confessor to the same views. And as to this unanimity of opinion, I cannot forbear here quoting from a letter I once had on another subject from Professor Owen. "The fact, he says, of like views of the same truths springing up in different independently thinking minds, is one of the good grounds of conviction in the reality of such views."

LECTURE TENTH.

The same subject continued. The views of Sir John Forbes. These identical with those of Gubler and Alison. Exhibited, here, in great part, in the view taken by him of the Nature of diseases and morbid processes.

1. In this sketch of the scholastic views as to the nature and workings of the curative powers of the living body, I have yet to adduce the teaching of Sir John Forbes as we have it in his well-known work "Of Nature and Art in the Cure of Disease,"—first published in 1855. For various reasons I have reserved him to the last. He will now come in to cap the deliverances of Alison and Gubler.

2. But before bringing him in form before you, I may be allowed to observe that, while at the hands of all the eminent men whose views we have had occasion to consider, save only Dr. Cullen, Art in the person of the physician has had a humble yet not an ignoble position assigned to it, it has nothing to complain of at the hands of Sir John. He fearlessly asserted the paramount claims of Nature, yet he dealt handsomely by Art. And yet at the time he gave us the work referred to—he was decried by not a few as a *Nihilist*. He was, however, simply in accord with Alison whom he quoted approvingly, and with Gubler who came after him. And he advanced nothing stronger in behalf of Nature than these two teachers have done, and nothing stronger

than they in derogation of Art. But instead of giving expression to his views as these have done in brief, he wrote a treatise bearing expressly on the subject. His doing so reminds one of the saying "O that mine enemy would write a book,"—a saying I have myself to bear in mind in now committing these lectures to the press. In that book he challenged attention to the whole subject in a manner altogether special; while the high position he deservedly held in the profession led to his being very widely listened to. He thus brought to the front the heretofore latent sentiments of his brethren. Not a few—very many in fact—gladly accepted his teaching as being in accordance with their own convictions. Yet not a few took exception to it; and the noisy ones—those that more or less keenly opposed his views, were perhaps those that least understood the true bearings of the questions at issue between him and them. And the noisiest of all were our therapeutic malcontents,—men who said and still say that the science of therapeutics is in utter confusion and a disgrace to us as a profession.

3. Having devoted an entire although a small volume to the discussion of his subject, it is not so easy as in the case of the other writers I have commented on, to give you a brief, or within the compass of a single lecture, a clear exposition of his whole views, such as he would himself have approved of. Nevertheless I will do my best to put before you a fair outline of them. It will be necessary, however, to make a selection from the great mass of the various materials he deals with;

and it appears to me that we shall perhaps best gather his leading views by ascertaining from himself what his notions were as to the *Nature* of diseases. Heretofore we have been discussing the relations subsisting between Nature and Art,—the organism and the physician,—the action of remedies and their influence on diseases. We may, I think, advantageously change our ground somewhat and look at our subject from the side of *Diseases* themselves. It is Disease that bespeaks Cure,—that involves in fact the whole controversy between Nature and Art; and it may help us greatly to understand what Cure implies if we rightly understand what Disease is. And Sir John's own views will, I think, fairly appear from what he says of diseases and their nature, views which directly lead him up to the whole question of their Cure and the relation in which Art stands to Nature.

4. What now were Sir John's views as to the Nature of diseases? He assumes, in common with M. Gubler, that "what we term diseases are not things different from or extraneous to the living body, but rather particular conditions of this; new phases, as it were, of its vital manifestations, or of its vital actions. They are essentially vital, that is, they are processes of a living organism, whether they come under the head of dynamic or functional, or of material or structural conditions or states,"—the latter, however, in "most if not all cases" being the result of the former, the dynamical leading to the organic or structural. (*First edition*, p. 55).

5. So much for his general view of what disease is—

considered in relation to the actions or workings of the living organism. "When diseases exhibit changes in the structures of the body, the constituents of these changes consist of material *identical* with, or at least of similar kind to the normal constituents of the body, and are aggregated and arranged by the very same organic processes which obtain in the normal state of health, only somewhat modified, it may be, by the new conditions present.

6. "We may state the same proposition (he says) more briefly thus: All morbid action is but a modification or perversion of some natural or some normal action or function; and all the physical results constituting morbid structural alterations, are mere perversions or modifications of natural or normal textures, or at least, analogous textures fabricated from the same materials by like processes."

7. "It will thus be seen that disease, contrary to the vulgar notion of it, is no *new* thing *superadded* to the living body and constituting a special *entity* in *rerum natura*, but is a mere group or collection of modifications of structures already existing, and of actions always going on in a living system." Again: Whatever the remote or external cause or causes, "the morbid state itself is always the product of the body itself, that is, of the vital actions always taking place within it, and of the materials of which it is normally composed."

8. Again: Diseases are "neither individual entities superadded to the body, nor v novel and original conditions of the structures or functions (actions) of

the body, but merely alterations, modifications, or perversions of the conditions existing in the state of health." No doubt, "they have special laws of their own, governing the manifestations of their general phenomena and course." Nevertheless, "these laws are, for the most part, only modifications of the normal laws of the system." Further, apart from those that result from specific external causes,—*e.g.*, poisons,—the greater number of diseases come (as he observes) of the agency of the surroundings which furnish the very conditions of our existence. So natural are diseases in their source and origin as in themselves.

9. In short, "Diseases are truly *natural* though not *normal* conditions of the living animal body; and they are formed and maintained and constituted by the *same* vital powers which regulate and constitute the *ordinary* conditions of health." Admirable this! Diseases *natural* conditions of the living albeit suffering organism,—the organism still acting as is its wont, only ill at ease.

10. This whole set of passages is one of the finest things in Sir John's book. The views expressed in them may be said to form the backbone of its entire framework, of his argument in behalf of the intrinsic, sovereign sway of the *Vis Medicatrix Naturæ.* The view here presented of the *nature* of diseases, "constitutes (he remarks) one of the strongest *à priori* grounds for admitting the reasonableness and the probability of the Natural Cure of diseases,—hereafter to be shewn as a matter of fact. If Nature, without any extraneous aid, either dynamical or material, can *build* diseases, there would seem no substantial rea-

son why she should not be equally able to *effect their removal.*" (*Ibid.* p. 78).

11. Once more: "What we term Health must be a state constantly varying in some of the elements which constitute it. The health of yesterday is not the health of to-day in strict philosophy, although the state is still properly called by the same name, so long as the alternations do not pass beyond the *bounds* of normal variations."

12. "In like manner, the elements or conditions which constitute Disease, being mere modifications of the conditions and processes of Health, must necessarily participate in the same natural variations; the state so called being still entitled to the name of disease, so long as it does not repass the abnormal boundary and recede within the limits of health." (*Ibid.* pp. 88-89).

13. Admirably put in force and clearness of expression, and as regards the truth of things, are these affirmations of Sir John Forbes, both as to what Disease is in itself, and what its relation to Health. And they lead him up to this general assumption,—namely, that Disease being what it is, and its relation to Health such as it is, and Life being conserved from day to day in the manner it is,—the same vital powers, the same vital actions, the same vital changes being constantly in operation, the *Cure* of Disease, however it may be aided (or for that matter impeded or hindered) by Art, must be essentially the work of *Nature* and of Nature *alone.* That is to say, the cure of diseases must

be wrought out and brought about by those self-same vital actions in which life consists, and by which life is sustained,—actions which when exerted normally constitute Health, and certain modifications or perversions of which (such as cause suffering or inconvenience, or endanger life) constitute what we designate Disease. When is health not health:—when is disease not disease? These are questions which the profoundest of physiologists and pathologists cannot answer.

14. Such, in brief, is Sir John's view of the agency of Nature in the cure of disease,—a view arrived at in part, or on one side, from a consideration of the *Nature* of diseases themselves. Other grounds he adduces in his work, but into these I do not intend to enter,—those already brought before you being sufficient for the purpose I have in view.

15. As to his precise idea of what he designates Nature, or as to his idea of the *Vis Medicatrix Naturæ*, it is identical with those of Alison and Gubler. And like these writers, in speaking of the action or the operation of the curative appliances of Art, he uses the very same words. He calls them *modifiers* of morbid actions, he speaks of them as modifying such actions. And as to the operations of Nature herself, he does not regard them as being in any sense *special*, or due to a power or to powers *sui generis*, inherent in the body. With him these curative powers are the ordinary vital powers constantly in play in the living body. And as diseased actions are as multifarious as normal actions, being but modifications of these, so the operations of

Nature for their cure must be equally multifarious. Nor is it inferentially that we learn that such were his views of these operations of Nature. He presents them in detail although briefly in his work.

16. A master-piece that work is; one that every advanced student of Medicine would do well to "read, mark, learn, and inwardly digest." Had this been done by those that opposed him at the time his work appeared, there would, I cannot but think, have been a more general concurrence in his views. Fortunately he was in a position to speak his mind freely. He valued truth more than his reputation; and he had the courage of his opinions. And deeply impressed himself with the importance of the views he held, he embodied them in that small volume,—bequeathing it in his old age as a legacy to the profession. It did good service to the legatees, and it will do the like to the heirs of these.

LECTURE ELEVENTH.

General Reflections arising out of the subjects treated of in the Lectures more immediately foregoing, and bearing particularly on the unsatisfactory state of the Science of Therapeutics and on the aspersions cast upon it, as set forth in Lecture First. Reasons for the assumption that this science never can or will attain to the certainty desiderated by many.

1. In my first Lecture I adverted to the disparaging terms in which the science of Therapeutics is spoken of by some members of the profesion. They speak of it, as I told you, not only as being in an unsatisfactory state, but also in a state that is discreditable to us as a profession,—and so forth.

2. Keeping in view what we have had before us in the lectures already delivered, let us now consider how the case really stands. That the science of Therapeutics is in an unsatisfactory state, all competent to judge will readily allow. Whence comes it that it is so? An important question it is; and we are now, I think, in a position to consider it to some advantage.

3. Two leading answers may be given to this question. Broadly stated, *one* is, our imperfect knowledge of the relations subsisting between Nature and Art in the cure of disease,—and, specially, of the precise

powers of each. The *other*, as regards Art, is, our imperfect knowledge of the action or the operation of remedial agents on the living organism, and above all the circumstance that in the use or application of these agents in disease, their action is habitually traversed by the concurrent action of the curative powers of Nature. Let us see how we stand in respect of these two general answers,—not treating of them formally however under separate heads, for they blend themselves the one with the other.

4. If the views as to the relation subsisting between Nature and Art put forth by Gubler, Alison, and Sir John Forbes be sound,—if they express the real nature of that relation,—and if it be true, as they affirm it is, that Nature is the real and only true healer of our dissases,—and that Art is only auxiliary to her,—subordinate to her; that it is to say (to obviate all misconception of their meaning) that it is the living Organism itself that works out the vital changes that are requisite for the removal of diseases and their products, and for the restoration of health, Art only aiding therein by promoting these vital changes, then we shall be prepared to understand,—in part at least, how it is that, with two distinct factors concerned, and very unequally yoked together, and our knowledge of the shares actually borne by each factor in the result, being very imperfect, the science of therapeutics should be in the condition it is alleged to be—unsatisfactory in the extreme.

5. If the view of those three physicians be sound; and if in fact in all diseases that admit of cure, Nature is evermore secretly working out their cure in ways

proper to herself, we shall at once see the first and the great,—nay the appalling difficulty that attaches to all our researches in the therapeutics of Art,—to all our inquiries in regard to the action or the operation of remedial agents,—and this as well positively or in themselves, as relatively to the curative operations of Nature. We shall see the difficulty, in short, of discriminating between the operations of Nature and the operations of Art or of estimating how much is due to each in respect of the cure effected.

6. In ordinary cases matters stand thus :—On the one hand, we have Nature represented by the organism, working out the cure of a disease in her own way; On the other, we have Art, in the person of the physician, more or less actively engaged in the treatment of the disease. The patient recovers. The question is—How much is due to Nature? How much to Art? Granted that Nature has had the larger, nay the main share in the result: it may yet be that Art although acting only a subsidiary part, has yet interposed so beneficially as to have accomplished what Nature unaided would have failed to do, and this in one or other of two ways, that is either in respect of a positive cure, or in respect of the warding off of a fatal issue. How then appraise the share of each in the cure? We assume, here, that but for Nature, Art would have been unavailing; and, *vice versa*, that but for Art, Nature would have been unavailing, albeit as regards each, in different degrees and in different ways. How estimate the share of each? That is the question that confronts us; and I call it an appalling question. For while, in some cases, it may

be possible to approximate towards a fair answer,—and especially in cases in which we have reason to believe that we have been instrumental in averting a fatal result—in others and doubtless in the great majority of cases, it will be exceedingly difficult,—let us frankly say quite impossible. How then, *can* our system of therapeutics be other than unsatisfactory? But is it therefore discreditable to us? Surely not.

7. Take another case—one of a kind of daily occurrence. We shall have Nature working her way towards the cure of a particular disease; and we shall have Art in the person of five or six different physicians, treating that same disease in as many different ways, some of diametrically opposite ways,—one of the physicians however treating it with placebos alone or by regimen only—virtually doing nothing. Let the case supposed be the Acute Rheumatism, or Rheumatic fever. The result, we shall assume, is the same,—or it is *inappreciably* the same under each. Recovery follows in all the cases, and it is alike satisfactory in all of them. And thus *experience* (experiment) may be appealed to, and confidently appealed to, in behalf of each method of treatment. But what as to their respective merits—for they cannot all of them have been equally beneficial? And what as to the respective shares of Nature and Art in the cure? Here we have two large questions to solve if solve them we can. As to the first, the respective merits of the several modes of treatment, how can it, *in the circumstances*, be determined? For in each and all of the modes, Nature has been at work,—silently it is true. And what if Nature has *secretly* been counter-

acting *wrong doing* in one or more of the modes,—and putting this (seemingly) on a level with the right doing in the others?

8. Let our therapeutic malcontents ponder these questions and make answer. The case now put before them is being enacted every day in a hundred different forms. How can our science of Therapeutics be satisfactory with problems like these meeting us at every turn day by day?

9. Ah! but Dr. Flint, they may say, has given us a golden rule whereby to judge of the relative, if not also the intrinsic, value of different modes of treatment. "The superiority of a method (he tells us) is shewn by a *larger* number of recoveries, and by an average duration *shorter* in a series of cases treated one way than in other series of cases treated otherwise." A golden rule it is indeed.—But, alas, as he shews, the fallacies besetting that rule, are such, and so many and great, as for scientific purposes to deprive it of all real value. "No two series of cases, he observes, are in all particulars exactly alike; and cases differ in the degree of severity and extent of disease, in the constitutional condition of patients, in the existence or absence of complications, and in a great variety of circumstances pertaining to season, climate, age, habits, &c." (*Principles and Practice of Medicine*, part I, chap. x).

10. The results of the treatment of acute rheumatism by Alkalies, Opium in full doses, Aconite, Lemon-juice, Blisters, Salicylic acid, and Mint-water,—all of them, it is said, equally satisfactory and equally rapid,—and with no appreciable differences as regards the tendency

to heart-complication, may be referred to as shewing the inadequacy of Dr. Flint's criterion in this as in many other diseases, and the extreme difficulty we have in estimating the respective shares of Nature and Art in bringing about the cure. If, as is affirmed by those who have tried it, the results of treatment when mint-water, avowedly a placebo, was alone employed, were equally satisfactory as under any other mode of treatment, we are driven to the conclusion that Nature is really the essential agent concerned in the cure. And here it may well be asked, whether, in as far as Art is concerned, the best method of cure in that disease has yet been decisively determined? Have we evidence to shew that under some one mode of treatment, the number of recoveries is greater, that the duration of the disease is shorter, and that the number and the severity of heart affections, are fewer and less, than under any other? I apprehend we have not,—or that we have not such evidence as to command the general assent of the profession. And yet the disease in question may well be regarded as a "*test*" one. For, while it is an acute disease, it embraces at least three distinct elements, one or other of which should answer to Dr. Flint's criterion. It has a constitutional febrile element,—a more or less localised inflammatory element in the joints,—and a specially localised inflammatory element in the heart. If I am not mistaken, Sir William Jenner has avowed his conviction that we are not yet at one as to the best treatment of that affection.

11. And I cannot but think that the like is the footing on which we stand as regards a large number of

diseases. We are not yet in a position to speak with confidence as to the best mode of treatment,—albeit we need have no difficulty in almost all cases in assigning to Nature the larger share in the cure of them. It is, in fact, her constant co-operation with Art that creates the difficulty we labour under in determining the relative merits of different methods of treatment. And this difficulty will evermore block our path both as regards the general question before us, and as regards the working out of a satisfactory system of applied therapeutics. Yet this diffculty is inherent in the nature of the thing, and there is no help for it. "Je ne vais plus me désoler de mon impuissance là où jè sens quelle est celle de la medécine elle-même." (Foussagrives, *Principes de Therapeutique generale*, 1875, pp. 28-29).

12. As to one thing I would here observe, which is this,—that we may often have greater confidence in estimating the good done by Art, when we have reason to believe that we have succeeded in averting a fatal issue, than in cases in which there has never been any question as to this. It is in those other (and these manifold) cases, in which life has never seemingly been in peril, that the difficulty so often referred to meets us and baffles us.

13. There is, however, one department of practice in which we encounter less difficulty in our therapeutic inferences. It is that bearing on the *relief* of pain or suffering. When relief from acute pain quickly follows the exhibition of an opiate, on the hypodermic injection of morphia, or the application of a warm poultice, or w[illegible]artburn abates on the administration of an

alkali, and when repeated instances of this have been observed by us, we cannot doubt that Art has really availed to bring about the results. Much of a like kind to this obtains in every day professional life;—much is done by Art that cannot be questioned or gainsaid,—and which is not lightly to be regarded in estimating the services which our noble profession can render to mankind.

14. It is, however, with the great problem of the *Cure* of disease, that our difficulty lies,—with disease on the large scale in all its departments, and with the removal of disease as distinguished from the mere alleviation of the distress or the suffering attendant on it. This problem is in its own nature really insoluble. In these days, in civilised Europe, the cure of disease rests on a two-fold basis, or it has two factors—Nature and Art. One of these, and the greater of the two, is independent of us and above us; and in its own way it is ever traversing the operations of Art and tending thereby to vitiate the findings of the latter. Much indeed has been done of late years by the careful study of the natural history of diseases, and by the experimental as well as the clinical observation of the action of remedial agents, to enable us to rear a more stable foundation for research in this field. But as things are and ever will be in this world of ours, it is not in the nature of things that the science of Therapeutics ever will, or can, as a science, attain to the perfection or the exactness so much, and by some so vainly, desiderated.

15. One valuable service our better knowledge of the natural history of diseases will render us in the field of

therapeutics. Combined with a sound knowledge of physiology, as the science of life and health,—and as the science also, rightly considered, of disease also; it will serve to guard us, in the daily exercise of our profession, against the illusions, and the misconceptions that beset us in that field. It will keep us from disquieting ourselves because of our knowledge of drugs being such and so imperfect as it is,—because of our Art being so limited in its power as it is. It will lead us to accept our position, without seeking to kick against the pricks. It is not, nor can it be regarded as discreditable to us, that we cannot do what Nature has denied us the power of doing. Well grounded in the natural history of diseases, and with a competent knowledge of the resources actually at our command, we may go forth to our daily work in life,—ever acquiring at the bed-side familiarity with Nature's ways and her curative processes,—and familiarity also with the virtues of our own resources such as they are, assured that dark as in many ways our path often is,—dark often in the matter of diagnosis,—dark often in the matter of prognosis, but dark especially in the matter of remedy, we have Nature evermore by our side, aiding us on all hands, covering over often and concealing our mistakes, counteracting our errors, in short, serving towards us the kindly offices of a partner. We may in fact have the inexpressible satisfaction, every one of us, of thinking that our practice is a partnership concern of the best kind, Nature doing the chief part of the work as regards the cure, but handing over to us the fees for the work done, and with the fees, the credit of the cure.

LECTURE TWELFTH.

Summary of the leading facts in the Natural History of Diseases, more particularly as regards their modes of Termination, that bear on the science of Therapeutics.

1. I have repeatedly indicated that my primary object in this series of Lectures on Therapeutics is to set forth under different aspects the foundation principles of that science. In this Lecture, I purpose, in pursuance of that object, to put before you certain general facts in regard to the natural history of diseases that seem to me to underlie that science. They are facts and inferences from facts, which I venture to designate fundamental.

2. What then in relation to Therapeutics, do we chiefly learn from what is known of the Natural History of Diseases?

3. (I.) The first and the leading fact is, that while the living organism is so constituted as to be liable to Disease, it is yet so constituted as to be itself adequate to the Cure of all those of its diseased states that are in their own nature, or intrinsically, curable. This is a fact; and it is unquestionably the foremost fact in relation to therapeutics. The living organism is itself competent to the cure of all the diseases it is subject to that are not in themselves incurable. The organism is

its own healer; or as Hippocrates put it "our natures are our physicians."

4. That the living organism is its own healer, that it is itself adequate to the cure of all its curable diseases, is a fact which we learn from observing diseases as they run their course naturally, uninfluenced by any interference on the side of Art. We thus find that in a large proportion of cases they terminate favourably. You may fancy that diseases are seldom left to themselves, that almost always they are subjected to medical treatment. This is true so far, yet only so far. For even in this and other civilized parts of the world, diseases are often left to the unaided powers of Nature. Far oftener is this the case than you may suppose. It is so among the lower classes very largely. But think of large regions of the earth, populous regions, in which there is no medical Art known, or practised in a way which we in England would look upon as of any value whatever. In truth, as I have again and again said, the far greater part of our race stands at this moment outside the pale of our Art. And yet all the world over disease prevails and is often rampant. Nevertheless, those suffering from it and left entirely to Nature get well in large numbers and recover perfectly.

5. The organism then, as I have said, is its own healer. Bear in mind that this is the first fact—the first great law in therapeutics. Being such, it deserves being repeated again and again, and set forth in all its manifold aspects. And let me say again, although in somewhat different words, that those diseases that are intrinsically curable have an inherent tendency to a favourable ter-

mination, that they tend of themselves to subside, to pass away, and end in the restoration of health. And happily this holds true of the *far greater number* of diseases, both acute and chronic. Were it otherwise, how sad it would be for many millions of our fellow men!

6. The great fact now in view, to wit, that the organism heals itself, imperatively demands being linked to another great fact, namely this, that the habitual tendency of all that goes on in the living organism is ever in the direction of health. This is the normal bent, the inherent *propension* of the several vital powers and processes of the organism. What an ally to the physician is that propensity of the organism; nay, what an ally it is to the organism itself when out of gear! Diseases in their own nature temporary-evanescent states; the organism ever striving after the maintenance of the normal—the state of Health. This is the *Vis Conservatrix* of Hippocrates and Stahl; and a mighty power it is. It is the ally as well of the *Vis Medicatrix* as of the physician. Still further, *causa sublata, tollitur effectus.* The occasion of dis-health taken away, or ceasing to operate, the morbid change ceases, the organism re-asserts itself, and health is restored.

7. Pray, take note of the two-fold fact before us:—disease a temporary thing, a state which passes away when the cause or the occasion has spent itself or been removed. Health the normal condition of the organism, and that towards which its energies are ever directed. Thus diseases are not only in their own nature transient

states which come to an end of their own accord; but they have the positive forces of the organism habitually arrayed against them. There is thus a two-fold pull against disease and in favour of health.

8. (II). Nor is this all. While certain diseases, or certain kinds of morbid action often or necessarily entail changes in the structure or in the functions of parts or organs that are more or less incompatible with the well-being of the economy, or even dangerous to life itself, there are yet provisions in the organism for effecting the removal of these lesions or for obviating the harm done by them, and thereby bringing about, more or less completely, the natural condition of the parts implicated. Many examples of this might be cited. Let it suffice meanwhile to adduce the retrogression of the morbid changes constituting pneumonia, the absorption of the exuded serum and lymph, and the restoration of the normal circulation through the lung. Yet let me adduce one other example. It is the healing of an ulcer by granulation and cicatrization, and the virtual reproduction thereby of lost tissue.

9. (III). Another general fact in relation to therapeutics which we learn from the study of the natural history of diseases, is of a negative kind. Yet it is all important in relation to the positive facts just put before you. It is this: that those diseases, or those diseased states that are inherently *incurable*, or for obviating the lesions of which the provisions of Nature are inadequate or unavailing, are, speaking generally,

incurable by Art; irremediable by it, otherwise than by that kind of intervention on the side of Art which does not fall within the province of therapeutics, namely, Operative Surgery.

10. This fact, we learn, as we have said, from what is known of the natural history of diseases, that is, of diseases as they run their course uninfluenced by Art. Exceptions may be taken to the general affirmation. Allowing that this may be done, it is yet to a slight extent only that it can. But the exceptions that can be taken are so few and of so questionable a kind, that they serve only to bring the general fact more clearly into view. It is sad to think that it should be so. It might have been expected that in some at least, if not in many cases in which Nature is impotent to cure, Art would avail. But it is not so. It is to be hoped, however, that the progress of practical medicine will furnish us with appliances that will bring certain of this order of diseases within the power of Art, will enable us, more particularly, to discover what we call *specifics* against them, more or less effectual; for example, effectual specifics against Tetanus, Hydrophobia, Pulmonary Consumption even, and even against Cancer. And it is to be hoped that the Anti-Vivisection Act will not be worked by the Home Secretary for the time being in such manner as to bar or hinder research in this direction.

11. A sad fact it is that there are diseases that are in their own nature incurable, which the organism cannot cure, and over which Art is as yet impotent. Yet it is matter for satisfaction that it holds of a large minority

of diseases. Happily, the far greater number of diseases are curable, inherently curable, curable by the organism itself, and in fact cured by it alone in many and these populous parts of the world.

12. (IV.) I have now to bring before you a very important therapeutic Question. Having regard to the fact that, in respect of those diseases that are intrinsically curable, there is on the one hand a spontaneous tendency to a favourable termination, and on the other, provisions in the organism whereby the lesions induced by them may be spontaneously removed or otherwise effectually obviated, and in short that Nature is herself adequate to the cure of all of them: having regard, again, to the fact that, in respect of those diseases that are in their own nature incurable, or which the organism fails to cure, Art is also powerless, may we not put to ourselves this question:—Whether, however Art may *aid* in bringing about a favourable issue, the Cure of all diseases that are in themselves curable is not really—not only virtually, but indeed and in truth the work of the living organism, and of the organism *alone?*

13. This may appear to you a very startling,—nay, a shocking question, one striking at the very roots of our Art. Yet truth is truth cut which way it will. And the question demands, I am inclined to think, an answer in the affirmative, or to this extent at least that all that can with truth be affirmed of the operations of Art is, that they are carried on *with* and *by* and *through* the curative operations of Nature. And if it be t[illegible]t is a truth of the highest importance in relation

to the science of therapeutics and the practice of medicine. Weighty inferences attach to it. If true, it assigns to Art simply the place or position of a *Helper* of the organism. It makes Art auxiliary only to Nature, subsidiary, subservient to her. Our drugs have no specific curative power. Such powers as they possess operate not in a direct counteractive way, but only by and through the curative powers of the organism. Ergot of Rye helps (often very effectually) to arrest hæmorrhage from the womb or from the lungs. But it does so simply by exciting more quickly than Nature does the contraction of the muscular fibres of the uterus whereby the bleeding vessels are mechanically closed,—or the retraction or contraction of the walls and ends of ruptured arteries, which is Nature's way of stanching hæmorrhage, or one of her ways.

14. The general facts now adduced as to Nature's ways of Healing, will be brought under your notice hereafter in detail. The subject is one of the most important in therapeutics; and it has bearings of the utmost consequence in relation to the whole Materia Medica. At present I merely refer to it as one that demands special consideration at this stage of our exposition of the subject before us. The whole set of facts comprised under it may be said to constitute the first lesson in therapeutics; and the student who has well learnt this lesson will have made good progress in that science.

15. (V.) It is not, however, by any means his only lesson. Indeed, in respect to the positive exercise of his profession, to the triumphs of his Art, there is a

no less important lesson for him to learn in the natural history of diseases. The former lesson may be said to teach him a lesson of humility. It shews him how humble his office is *relatively*, inasmuch as it shews him that it is Nature that does all, and that where Nature fails, Art fails also. Yet happily not always. The other lesson now in view is one which teaches him how it is that in diseases that are intrinsically curable, but in which from *circumstances* Nature is impotent, Art may often step in and carry the day triumphantly against Nature. It is the lesson—How to ward off Death. This is specially the bright side of Art. It will be fully considered hereafter.

16. Let me now give you a brief summary of what I have just put before you.

First. Those diseases that are in their own nature curable, have an inherent tendency to a favourable termination, to a spontaneous decline and cure. And this fact holds of the far greater number of diseases.

Secondly. In respect of those diseases that are thus curable, but in which nevertheless, while still running their course, lesions are produced by them in parts or organs, there are provisions in the organism for effecting the removal of these lesions, or from obviating harm from them.

Thirdly. Those diseases that are naturally incurable, incurable by the living organism itself, are, speaking generally, incurable by Art. Fortunately this holds of a comparatively small number of diseases.

Fourthly. What we thus learn from the study of the natural history of diseases points to the inference that, however Art may avail in the cure of disease, the operations of Art are, all and whole, auxiliary only to the operations of Nature, and are effectual only by, with, or through the agency of the organism. In other words, Art must move on the lines of Nature: the Therapeutics of Art must rest and be reared on the Therapeutics of Nature.

Fifthly. Further, in the case of those diseases that are in their own nature curable, it not unfrequently happens, or it may of necessity from circumstances happen, that before the organism has had time to work out the cure of them, imminent peril of life may arise and death be threatened. In such cases, Art may often effectually come in aid of Nature, not by curing the disease, but simply by obviating the tendency to death, sustaining life until the disease has spent itself, and been cured by Nature.

17. These, I say, are leading facts in relation to the science of therapeutics. It follows from them that the great thing to be done in the study of that science is to acquire a thorough knowledge of all that part of the natural history of diseases that relates *first* to their Modes of Favourable Termination, and, *secondly*, to their Modes of Fatal Termination.

LECTURE THIRTEENTH.

On the proper Sphere of Art in the Cure of Disease. Wherein its real power and value lie. General remarks. The indirect power of Art, in which nothing is attempted beyond aiding Nature; (1) In the way of Nursing; (2) In the way of Obviating the tendency to Death; illustrations of this, shewing how Art may avail to the saving of life without seeking to cure directly; (3) Reference to the ways in which Operative Surgery, while furnishing triumphs of Art, is yet beholden to the Vis Medicatrix.

1. Having now looked at our science of Therapeutics from more than one of its manifold aspects, but especially from that which Dr. Flint regards as the true point of departure for that science, namely, the natural history of diseases, and, above all, the modes of their natural termination, whether in recovery or in death, I purpose now, before going further, to submit to you in this and in one or two of the Lectures immediately following, some general remarks on the proper Sphere of Art and its resources, and also as to wherein its real power and value lie:—and in doing so, I shall begin with the simpler of the relations of Art, and then lead you on to the more complex, or those in which Art and Nature come to be so entangled the one with the other as to make it difficult to distinguish between what is due to the one and what to the other.

2. That directly and indirectly Art may come in aid of the curative powers of the organism, will be allowed even by those that most stoutly contend for the supremacy of Nature. That the drugs we make use of in the treatment of disease, may at least help the workings of Nature no one will deny. How far they actually do so, and how far, even apart from drugs, Art may avail, we shall now proceed to enquire.

3. (I.) One way, the most obvious of all and the simplest, yet not the least important, is that of *Nursing*. Here the powers of Art are undeniable, and indeed often signally efficacious. A person stricken of Typhus, prostrated by it, and delirious from it, would inevitably perish of it, if left entirely to himself. He could do nothing for himself in respect of food or drink, or of the other calls and requirements of the system, or in respect of warmth or cleanliness. However mild the fever,—however strong its tendency to a favourable issue, the patient could not possibly hold on through the weeks occupied by it. He would to a certainty succumb,—not, however, directly from the fever, but from the circumstances attaching to it, and specially from starvation and cold. He recovers:—and we shall suppose that during his long illness he has had nothing but the watchful and intelligent services of a female,—without at any time the exhibition of a single drug, with no wine even,—with nothing beyond suitable food and proper domestic offices. Let this one instance suffice to illustrate the reality and the magnitude of the aid furnished by Art to Nature. Yet nursing, however careful, is in no sense curative, or curative in the

popular acceptation of the term. It merely gives Nature fair play.

4. (II). There is another, already many times referred to in these Lectures, which may with propriety be brought in here after Nursing, and which it is important to bring prominently into view. It is that of *warding off death*, without this being done in a sense that can rightly be called curative. Here also the efficacy of Art is often conspicuous.. And yet in many cases it is, like Nursing, indirectly only. It is merely such as to maintain or sustain life while the disease the patient labours under is running its course; or it is such as to enable Nature to hold her own and successfully exert her own curative powers, when. otherwise, death would intervene and put an arrest on these.

5. In all, or almost all diseases, even in those in which the tendency to a favourable termination is of the strongest,—even in those that may in their own nature be of the mildest, circumstances may exist or may arise during their incumbency and before they can reach their happy issue, to entail peril of life. In many such cases Art may successfully interpose to the saving of life. Suffer me again to refer to the *œdema glottidis* (Lecture II, § 27). In a case of this sort the inflammation may, as to its degree, be of the slightest,—not worse than that produced by the sting of a Bee,—so slight as to subside in a few hours. Its gravity attaches to the seat it occupies. The inflammatory swelling so narrows the tiny chink of the glottis as to bar the access of air to the lungs. A certain point of

narrowing reached, death within a minute or two is the inevitable result—unless it can in some way be averted. Now this may at once and effectually be done by making an opening into the windpipe below the glottis. But observe, all that Art does is to enable the patient to breathe,—and breathe freely, when otherwise he could not. It does not in any degree operate in the way of subduing the inflammation, nor is its purpose in any genuine sense curative. The life of the patient is assured by the operation performed. It is Nature that cures the disease in her own way, and quietly at her leisure.

6. Take another example. A person shall be in a state of *Coma* from the action of a narcotic poison—say Opium, such and so great as that death may follow. In such a case we may have recourse (among other expedients—such as flipping) to the Artificial Respiration. Maintaining this while the narcotism lasts, we enable the patient to breathe and thereby to live. Here again Art avails to the saving of life when Nature would fail. But here also Art avails not by removing the Coma but simply by tiding the patient over it, by keeping him alive until the Coma—a transient state, has passed away.

7. In other ways besides, Art may thus indirectly avail to the saving of life in the treatment of disease. The two now adduced may be thought by some to be of a surgical kind, or to involve measures of a sort already said not to come within the sphere of Therapeutics. No exception indeed can fairly be taken to them on that ground. Yet let us take another illustration of a kind

purely medical or exclusively coming within the physician's department. Let it be that of *Peritonitis* from perforation of bowel or stomach. This disease, indeed, is all but invariably fatal, and within a very few hours. Yet now and again cases are recovered from when treated with Opium in large doses, frequently repeated. Are such cases *cured* by the opium? That is the real question here, and a crucial question it is. Let the question be thus otherwise put: Is opium curative of Inflammation in a *direct* sense, or of peritoneal inflammation specially? This will not, I apprehend, be alleged. In what sense, then, are such cases of peritonitis *recovered from* under the use of the opium exhibited? It is, I believe, simply by the opium obviating the tendency to death, and in *no other* way. And it does so, I conceive, in three distinct ways, all of them working together to the same end.

First. The opium blunts the cruel—the singularly depressing—pain attendant on the disease, and doing so it proportionately lessens the danger attaching to it. For, as is well known, the danger (as judged of by the *rapidity* of the fatal event) is proportioned to the *intensity* of the pain. *Secondly.* The opium sustains the *Vis Vitæ*, and specially the action of the heart, during the incumbent period of *danger*,—a period in itself brief; and thus it carries the patient over it. How great, by the way, the sustaining power of opium in certain cases is! Nor is it always appreciated as it deserves.*

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* Treating of Opium in his *Essentials of Materia Medica*, Dr. Garrod remarks, that "when given in small doses, frequently repeated, the force of the circulation can be kept up for a long time."

Thirdly. The opium keeps the inflamed bowels in as complete a state of rest as in the circumstances is possible. Rest is of essential importance in the case of an inflamed knee-joint. It is not less important in peritonitis to suspend the peristaltic movements of the intestines. How important it is, both Dr. Abercrombie and Dr. Stokes have well shewn, cases being recorded by both, in which, after recovery seemed fully established, a fatal result followed the exhibition of even a mild aperient.*

8. I have long looked upon this as an admirable exhibition of the efficacy of Art in the way indicated, the remedy in question operating simply by obviating the tendency to death. As far as I can judge, the opium can operate in no other way than that now insisted on. Opium is not a recognised remedy for inflammatory

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(4th Edit. p. 203). There is a great deal of important practical truth in this remark. In peritonitis, however, the doses, frequently repeated, require to be much larger than under ordinary circumstances. Narcotism is not readily induced by it in that disease; and the absence of that effect of it admits of our giving the drug freely, not only without danger but with great advantage to the patient.

* In one of the volumes of the *Dublin Quarterly Journal of Medicine*, Dr. Stokes gives an exceedingly interesting case of this kind. The case was diagnosed to be peritonitis from perforation. Opium was freely given. Recovery seemed fully secured when, unfortunately, a mild aperient was prescribed. Directly, the disease was reproduced and death quickly followed. The *post-mortem* inspection (while verifying the diagnosis) shewed that the mischief had resulted from the action of the aperient. It had set the bowels in motion, and this had torn asunder the curative adhesions in the course of formation. See also, Dr. Abercrombie's *Pathological and Practical Researches on Diseases of the Stomach and Intestinal Canal*, 3rd *Edit. p.* 174.

diseases generally, still less in a direct or positively curative sense. Were it such, it would long ere now have come to be regarded as our sheet-anchor in that affection, and to be resorted to much more largely than it is, checking the inflammatory process by some direct, sedative, anti-phlogistic power inherent in it. Inflammatory diseases are said to be the cause of the far greater part of the mortality that obtains in the world. Were opium a direct counteractive of it, a sovereign remedy for it, we should hear more of it in that sense than we do. Rather is there a prejudice against it in this class of affections.

9. In connection with the subject before us,—this indirect use of opium in certain diseases, and its *sustaining* power, keeping the patient alive till the calamity is overpast, (a subject I have always regarded as of the deepest interest and the utmost practical importance), allow me here to refer, incidentally, to a statement I met with somewhere many years ago. It is this:—that the success attendant on surgical operations for the relief of strangulated Hernia, is just in proportion as opium is fully and freely exhibited for some little time after the operation. The principle involved here must, in the main at least, be the same as in cases of peritonitis, keeping the bowels quiet and sustaining the *Vis Vitæ* until the danger attaching to such inflammation as may result from the operation and its antecedents has passed away. How far Chloroform, administered during the operation for Hernia, by assuaging the pain of it and enabling the operator to do his work more deliberately and with less drag on the patient's heart,

may have come to supersede the use of opium, we need not now particularly inquire. I should incline to think that the exhibition of it for a day or two, or a few days after the operation, would still be highly beneficial in the way just now suggested,—that of obviating the tendency to death, without otherwise exerting any curative action.

10. I have gone into the subject of the action of opium in peritonitis, more fully than was perhaps needful for the mere illustration of the point immediately before us. I do not think I have. But should it be thought that I have, I would plead in justification of so much detail, the great importance of that piece of practice, with this further remark—that I have nowhere seen an adequate explanation of the practice in question —first confidently urged by Dr. Armstrong, Dr. Alison, Dr. Stokes, and others, and now generally acquiesed in.

11. (III.) What I have heretofore been urging on your notice in this lecture, in relation to the proper sphere of Art, has had an exclusive reference to its *indirect* power, in which nothing of a positively direct cure is in view, or nothing beyond giving fair play to Nature, or sustaining life till the danger attendant on a disease has passed away. And in this connection, or as regards the indirect power of Art, reference may I think be advantageously made here to the resources of Surgery, in as far as these essentially rest on the resources of Nature. The instruments and the processes of Surgery do not indeed fall within the department of therapeutics. Yet while they shew how great the resources of this branch of Art are, they shew also how

greatly it is beholden to Nature; and it is with this view that I now bring it under your notice. Great and manifold as are the blessings that have accrued to mankind from our modern Surgery, this Art would avail but little but for the *Vis Medicatrix Naturæ*. Amputations would be impossible were there not provisions in the living organism for the permanent arrest of hæmorrhage, and for the cicatrisation of the wounds inflicted. In vain would the surgeon set the ends of the bone in a case of fracture, but for the exudation and solidification of callus to cement the broken ends; or reduce a dislocation, if the torn ligaments did not admit of being healed spontaneously. The cure of aneurism by ligature would be impossible but for the series of changes that ensue in the artery tied, and in the adjacent blood-vessels, whereby a new route is provided for the maintenence of the circulation and the nutrition of the parts beyond the seat of the aneurism, while the atrophy of the aneurismal tumour is the work of the organism. It were useless to multiply illustrations. For at every turn our modern Surgery, of which we have reason to be proud, is dependent on the curative provisions of Nature,—and it serves well to bring these clearly before the mind. Well deserving of consideration with that view it is by the student of Therapeutics. The whole Art of Surgery is rooted and built up in Nature. Nay, Surgery is in many respects better suited than Medicine to throw into bold relief the reality and the wide range of the curative and the recuperative powers, provisions, and processes of the living organism. And was it not by the study of Nature's ways that John Hunter did so much to advance that noble Art?

LECTURE FOURTEENTH.

The proper Sphere of Art in the Cure of disease continued,—but in relation now to the Materia Medica. In some cases the efficacy of Drugs is certain, and their action easily explained; in others, their efficacy is certain, but their mode of action unknown. These are called Specifics. All other drugs are only auxiliary in various ways to the curative powers of Nature. Fallacies attaching to observations on the action of drugs from the concurrent agency of these curative powers.

1. In connection with the proper sphere of Art in the cure of disease, we now come to a part of our subject which is much more difficult to grapple with, than that which occupied us yesterday. It is the relation of Art to Nature, or if you will, to Disease in respect of those agents that we specially call remedies, and the greater number of which have a place in the National Pharmacopœia. Drugs we call them, or most of them; and it is drugs that I have now in view.

2. It is these weapons of our Art that stand out most prominently in our own view as medical men and in the view also of our patients. Paper, pen, and ink are laid on the table in the sick-room, or the consulting-room for the prescription. Verbal directions for the treatment of the invalid may be all important in their way: and they may be duly appreciated by the patient and his friends. But, in almost all cases, it is taken for granted that drugs of some kind shall be prescribed and taken. And it is on these that the hope of a cure is largely built. Is it not so, almost universally, with rich and poor alike? A first visit without a prescription, in a case that to the patient or his friends seems at all serious, would be looked upon as money thrown away. The late Sir John Forbes, who had great, yet no undue faith in Nature, once told me that on one occasion in a case that seemed to be, but was not really serious, he confined himself to advice, spoken. He wrote no prescription for his guinea fee. The result was, that he was not again consulted on the case. The patient dissatisfied, he learnt, went elsewhere, and got value for his money in the way desired,—that of a prescription.

3. This anecdote and the foregoing remarks are intended to shew that the public at least have faith in drugs,—believe them to be curative, and no doubt in a direct or positive sense. And I apprehend that many members of the profession are on that point at one with the public.

4. As regards the general public, nothing shows more clearly the strength of its faith in the efficacy of drugs than the number and the variety of the Quack advertisements that fill columns in the newspapers, and the known success of large numbers of the Quack fraternity. One of them is said to spend £30,000 a year on advertisements alone, to be met with in newspapers in every part of the globe. This he would not do, were he not repaid a hundred-fold. Again, they offer their nos-

trums in ways that tell very decidedly on the imagination of the public. They speak of them as purifying the blood, sweetening the blood, notions the public think they can understand, and so forth. Endless the snares are they lay for the public.

5. That the things we speak of as drugs, agents that constitute the *Materia Medica*, do avail in the cure of disease, is on all hands allowed. Yet the *extent* to which they do so, and the *mode* in which they act, are very difficult and perplexing questions. Unfortunately, we are too much in the habit of looking at them and speaking of them as if they operated in a direct or independent way, or as if we had, simply, on one side, the thing we call a disease, and on the other its counter-active—a drug in the pharmacopœia. Whereas we have in fact in disease (disease inherently curable) a tendency to a spontaneous favourable termination, backed by a strong pull in the organism itself to revert to the state of health. How to do justice here between Art and Nature, between drug and organism, and disease, is beset with difficulty. There are questions in physics and in morals that are insoluble, not because of the facts involved, but because (as Professor Tindall remarks) of the *complexity* of the facts. It is so here to a very great extent.

6. Let us now attempt to feel our way in this direction, proceeding cautiously, by *sap* and *approach* as it were, from the simpler to the more complex cases we have to deal with in medical practice. But, pray consider at the outset what we have to deal with. It is

drugs and their physiological actions on the system, drugs and their efficacy in disease, drugs in relation also to the curative powers and provisions of the organism, and to the organism itself as ever striving after the restoration of health. How complex are the phenomena to be considered ?

7. To proceed ;—One is ill, and the illness is attended with persistent wakefulness, such wakefulness as is not only distressing in itself, but may be perilous. In Delirium Tremens, and in some forms of Mania, we have such a state. Opium is administered, or Bromide of Potassium, or Chloral. Sleep,—sound refreshing sleep follows, and the patient quickly gets well. Here the problems to be solved are simple, and the solution easy. Yet more might readily be inferred than the facts warrant. We cannot doubt (ample and varied experience justifying the conclusion) that it was the drug exhibited that induced the sleep. But did it do more than this ? That is the real question in the larger question of the *cure* of the disease. And here, I apprehend, the answer must be in the negative. It was the sleep that was induced, and this alone that effected the cure, Nature cooperating. It may be allowed that the drug exerted a general calmative or soothing action beyond the mere inducing of sleep, and that the further action contributed to the cure. But it was the sleep that really wrought the cure. It cannot be alleged that the drug in question or any of the drugs named above has any direct or specific power over delirium tremens or the milder forms of mania. But let us take a somewhat more complex case of an analogous kind. There is a

peculiar state of the nervous system and of the mind met with in some kinds of fever, typhus, and others, in which persistent wakefulness and incessant rambling talking are the predominant symptoms. The combination of symptoms to which I refer has received the name of *Ataxic*. There is great mental and nervous and muscular activity, commonly of a quiet sort; but the leading feature of all, is abiding, persistent wakefulness. These cases are full of peril, often proving fatal, somewhat suddenly, in the way of Syncope. The peril undoubtedly lies in the wakefulness. These cases need great nicety in the management of them. Sleep is the great desideratum. This, and this alone (apart from sustaining the general *Vis Vitæ*) is the object to be attained, if possible. In certain of these cases that object *is* attained by the exhibition of an opiate or of opiates in small doses, or of Chloral in like doses. The danger attaching to the remedy is the inducing of Coma. But if sleep, continous gentle sleep is produced, recovery in many such cases follows. Now, judging from the ample experience had of such cases, we cannot doubt that the chloral or the opium exhibited induced the desiderated sleep. And by inducing sleep, the life of the patients may have been secured. But that is all that the drugs in question have done, unless it be in addition that they have tranquilised the general system. Apart from thus saving life in these cases, it were unwarrantable to say of either of them that it cured the fever, or to designate it a febrifuge, or to allege that in a direct or specific sense it is curative of brain-fever. Signal as may have been the good done by the drug, there is no mystery or any difficulty in explaining its action. It was simply by inducing sleep that it did good; and beyond this we are not entitled to affirm anything as to its action or remedial value. Would that in regard to all the articles of the materia medica, or in regard to cases of like complexity and difficulty, we saw our way with equal clearness.

8. Let us take another case :—One is suffering acute pain in some part. The pain is persistent, perhaps it goes on increasing. An opiate is administered, or solution of morphia is hypodermically injected. Complete relief is got in a brief space of time, or at once. After a time the pain recurs and is again severe. Like measures are followed by like relief. Here we cannot doubt that the opiate has availed to relieve the pain. How it has done so is another question, and we may be unable to say more than that such is the nature of opium. But it is always a great thing, and it is one of the chief things in Therapeutics to be well assured as to matters of fact, to feel sure in any case that the *post hoc* is really consonant with the *propter hoc*.

9. Take another case. A person has swallowed poison, of set purpose, or accidently. At once, or within a very short time, sulphate of zinc in solution, or flour of mustard diffused in water is administered. In a trice vomiting follows, and the patient gets quit of what if retained, might have cost him his life. Here we cannot doubt that the drug exhibited induced the vomiting, and repeated and varied experience has not only satisfied us that there are substances that excite vomiting, but has furnished us with an ample list of substances that do

so, and with the specialities of the action of each. Here also we are well assured of matters of fact in regard to the articles of the materia medica called *Emetics*, although we may be unable to say how they act, or why they differ in their mode of action, why some are speedy of action, others slow. And so of the things called Purgatives, Diuretics, Sudorifics, and others. We know more or less thoroughly the effects they produce on the living organism; and we can often see how it is that by the effects they produce they do good in disease, without our having to beat about the bush in quest of direct or specific curative powers as inherent in them. When we can clearly connect the remedy with the disease; when we know and understand what the disease is, and what the remedy does; and when we learn from experience that it really does avail for the removal of the disease, we know a great deal, even although we may be unable to go beyond the simple fact. As it is, we already know much in this simple way. But it is to be feared that our ignorance far exceeds what we really know. Indeed it is very certain that such is the case; otherwise our science of Therapeutics would stand on a widely different footing from what it does, and clear of the maledictions of our therapeutic malcontents.

10. As yet I have gone no further than to refer to some of the simpler cases in pathology and therapeutics, that is, to those in respect of which we can see our way clearly between the disease or some essential element of it and its remedy.

11. And here, before going further and deeper, I may refer to a set of cases in which we have no doubt as to the efficacy of the remedy, but in which we cannot, on any known principle, connect this remedy with the disease so as to explain the *ratio medendi.* Gout is one of these. What Gout is we do not very well, or at least fully, know. It may be questioned whether we have yet got to the root of it. But we know that in many cases Colchicum exerts a marked curative influence over it,—that the subsidence of it so rapidly follows the exhibition of the drug as to leave us in no doubt that it has cured it. Yet how it thus acts we are wholly ignorant. We know the action of colchicum on the healthy body; we know in detail and precisely what is called its several physiological actions. But we cannot as yet in any way connect its physiological with its curative action in gout. The like holds of Mercury in secondary Syphilis, if it be true, as is alleged by many, that it really exerts a curative action in that disease. And so also of Quinine and Arsenic in Ague. This last is an affair altogether unique. Neither of these drugs cures ague in any proper sense. The effect they have is that of breaking the chain;—of preventing the recurrence of paroxysms;—and in that sense they may be said to cure the disease. How they do so, whether they take effect on the morbid state itself, or on the palludal poison within the system, we do not know. But over the febrile paroxysm itself they are powerless. We know very well the several physiological actions of Mercury and Quinine and Arsenic. But we cannot connect that knowledge with their remedial action in the diseases indicated.

12. Drugs of the kind now in view we designate

specifics. Abundant experience shews that they do avail to arrest or mitigate the diseases named and bring about, more or less completely, the restoration of health. How they act we cannot at present say. It is almost universally allowed, however, that the three or four drugs specified, to wit, Colchicum, Mercury, Quinine, and Arsenic, as regards the diseases indicated, are the only ones in the whole materia medica that come within the category of specifics.

13. All the *other* articles in the materia medica (and many hundreds they are) exhibited in diseases that are in their own nature curable, and in effecting the cure of which the curative powers of the organism are themselves evermore operating, are only *auxiliary* to these powers. Our great business in regard to them when administered in the treatment of disease, is by empirical observation in the first instance to satisfy ourselves that, however they may act, they do really conduce to the cure or the relief of disease. You will at once see, however, from what I have just said, that with the organism itself as a factor, such observations are beset with great difficulty, that the sources of fallacy attaching to them are many and great. As regards the mere relief of suffering indeed, and as regards very many subordinate matters, we need have no doubts or misgivings. It is when we come to diseases of a decided kind and in full swing, and on the large scale, as they stand in our Nosologies, that our difficulties arise. Yet here, one might suppose, that we have in Dr. Flint's test, a criterion of great value. That test lies in this:—Is the decline and cure of

diseases *sooner* accomplished, and in a *larger* number of cases, when drugs are exhibited than when Nature is left alone and unaided? This in one sense is the question of questions in therapeutics. Can a disease which left to itself lasts on an average a fortnight, be brought to an end in a week? One would think that by this time such a question could be answered with some degree of precision. It is conceivable that in some cases, diseases, if taken in time, if attacked when they are only threatening, or in the bud, may be cut short and prevented going on to their full consummation. Many facts indicate that this may be done. An incipient catarrh may often be cut short by a full opiate exhibited within twelve or twenty-four hours. (Watson's *Lectures*, lect. xlviii). Professor Ringer confidently asserts that acute inflammatory diseases, if dealt with at once, or within a brief space of time, will readily yield to Aconite; and he adduces in proof of his assertion the rapid subsidence of the acute tonsillitis, an affection which can be seen with the naked eye. Perhaps in as far as regards a general principle, Professor Ringer is somewhat sanguine here. If, however, what he says be a fact, and applicable to inflammatory diseases generally, it is one of the highest value, although its practical importance would be greatly diminished by its holding only of inflammations when taken at the beginning, a thing seldom done.

14. But allowing that certain diseases may thus be nipped in the bud, we are yet, I apprehend, very fa from being in a position to return an affirmative answer to Dr. Flint's criterion as to the efficacy of our drugs

in disease, when applied to diseases on the large scale and fully developed. The acute rheumatism, as I before remarked, might well be supposed to furnish a peculiarly favourable criterion of such a question among febrile and inflammatory diseases, and so might Hooping-Cough and Chorea among nervous ailments. But have they yet enabled us to respond to it with anything like confidence or satisfaction? I fear not, although as regards the two nervous affections, I am free to admit that we have made some approximation to a favourable answer, an admission which perhaps may hold more largely of this class of affections than of almost any other. There can be no doubt as to the efficacy of bromide of potassium in epilepsy.

15. I beg you will bear in mind that in speaking as I have done of such of our remedial agents as have a place in the Pharmacopœia, I have not been speaking of them as if they were *inert* in the treatment of disease. That they avail largely in many ways for the relief of suffering and inconvenience, and in aiding the curative powers and provisions of Nature, I have no manner of doubt. What I have had in view in the remarks made, is their direct or positive power in the cure of disease. And as to this I will content myself at present with putting before you the most recent formal utterances we have on this subject. I will put before you what Dr. Bristowe says in his recently published work on the *Theory and Practice of Medicine*, (pp. 120-121). And I quote him the more readily because of his position as a London hospital physician of large experience and as a metropolitan teacher.

16. "The great aim (he says) which the medical man places before himself is the *cure* of disease. Unfortunately, however, a *direct* cure, at all events a direct cure by means of *drugs* is, in *the great majority* of cases, totally impossible." "We may in a small number of cases, by the use of specific medicines, materially alleviate, and it may be absolutely cure, certain diseases—by arsenic or quinine, ague; by mercury, syphilis; by colchicum, gout; by iron, chlorosis." This, excepting iron in chlorosis, I have already adverted to, and very little it amounts to, considering the wide range of the materia medica, and the exceeding large number of diseases we are liable to. But, pray take note of what he says further:—"But we cannot . . . by specific drugs . . . cure the infectious fevers or internal inflammations, or carcinoma, or degenerative changes, or many of the functional and other disturbances to which the organism is liable. Most of these affections, indeed, take a course peculiar to themselves, tending in some cases towards ultimate recovery, in some towards chronic ill-health, in some towards speedy death. We can do little, often nothing, to *arrest* them in their progress, or to put *limits* to their *duration*." Note particularly his two concluding remarks, to wit, our inability, as a general rule, to arrest diseases in their progress or to abridge their duration. This is all he has to say, at least in a general way, of our materia medica, in a general view he takes of the whole of our remedial appliances,—regimenal or dietetic, mechanical or surgical, and medicinal. And a sorry estimate it is of its intrinsic value. If it be a true estimate, while it is in

no respect higher or greater than that I have myself put before you, it is, I apprehend, such as it is by reason of the ordering of Nature. We ought indeed, ever to strive after getting Nature to reveal to us as many of her secrets as possible in this as in other departments; but we ought equally to strive after and to hold by the truth of things, rather than take up with the whims and the fancies of mere theorists or of pretenders.

17. I have yet somewhat further to say about the articles of the materia medica. But this I shall defer till to-morrow.

LECTURE FIFTEENTH.

*The proper Sphere of Art in the Cure of Disease continued,—in relation still to the Materia Medica. Our knowledge of the actions and uses of Drugs much more limited than might be supposed. Misconceptions as to the actions of Drugs, arising out of (*a*) the conflicting statements of different authors as to matters of fact; (*b*) the want of precision met with in books respecting the same, and the frequent blending in the exposition of facts of the essential and the incidental. Confusing effect of all this on the minds of Students.*

1. In my last Lecture I entered on the consideration of what is known as to the intrinsic curative value of those remedial agents that have a place in the Pharmacopœia. I did not then complete what I have to say in a general way on this subject. To day I will ask you to accompany me a step or two further.

2. Yesterday I set out by observing that the public have faith in physic—faith in drugs. Great indeed is their trust in them. The public must assume, one would think, that the profession is fully acquainted with the precise actions and the curative uses of every drug,—can tell what it does, how it acts, and what and how it cures. Yet how wide of the truth that idea is! How imperfect our knowledge of even the physiological actions of very many of them is, that is, of their actions on the living body in the state of health.

3. We know fairly well the effects produced by Senna, Rhubarb, Aloes, Ipecacuanha, and Opium. Yet even as to some of these, and as to a large number of the commoner drugs, our knowledge is of the most general kind. Once they are swallowed, they pass from our more immediate observation. Whether they are acted on in the juices of the stomach, or whether they are taken up into the blood unchanged, we know very little. How they meet and touch the part or parts they more obviously affect, we do not know,—or know with any certainty. We do not know the more minute particulars of their action on the blood,—on this organ and that,—on this secretion and that. This is still more true of others,—of Bismuth, Zinc, Arsenic, Corrosive Sublimate, Aconite, Calabar-Bean, Digitalis, Hemlock, Camphor, Lobelia, Guaiacum, Pareira, and even Calumba and Gentian. What do we really know of the action of Bismuth, or of Gentian? Virtually nothing directly. And so of many of the drugs just named, and of others. Our actual knowledge of their precise action is of the most general kind, vague, and as to several of them matter of inference only from experience of their use in disease. Gentian is said to be a tonic; it is called a bitter, or a stomachic tonic. But how does it act? Does it increase the quantity of gastric juice secreted during digestion, or improve the quality of this juice? Or does it act on the nerves of the stomach? We cannot say. Aloes and Myrrh and Iron conjoined are said to have the power of promoting or restoring the menstrual flux. Experience says they have. But what is the share of the Myrrh and of the Iron and the Aloes

in it? And do they act on the ovaries, or the uterus, or the blood? There is a set of purgatives called *cholagogue*, *i.e.*, drugs thought to act on the liver as well as on the bowels, increasing the secretion of the bile. Mercury is one of them. Podophillum another. Aloes another. What do we know with any degree of certainty as to this, notwithstanding the many researches made to determine the action of this class of drugs?

4. A large amount of our knowledge of the Materia Medica rests on experience, or on little more than this. And yet in our "provings" by experience we are always beset and often "sore let and hindered" by the ever present and persistent *Vis Medicatrix*. As far as disease is concerned, it will not, in these our provings with drugs, step aside even for a moment and let us inquire for ourselves apart. And, then, in the absence of disease, we have often no ground to stand upon, no data to go upon, with many of our drugs. In the case of one with a good appetite and an easy digestion, what have we to say as to the action of Calumba or Gentian or Chireta,—or with a sound heart and healthy kidneys, as to the action of Digitalis, or Prussic Acid? Is Digitalis a diuretic in the healthy state of the organism, or in other forms of dropsy save those dependent on Mitral disease of the heart? Opinions are conflicting as to this, and the facts indeterminate.

5. Then, again, in as far as we are agreed in regard to the precise effects of articles in the Pharmacopœia, which, sad to say, is very far from being the case as to many, how discrepant often are our explanations of their action, or as to the physiological expression of

this! Here we are greatly in the dark; nor does it seem likely that we shall soon attain to a thoroughly satisfactory position in regard to it. Even disease apart, and the *Vis Medicatrix* apart, there are enormous difficulties in our path in this department of inquiry. And it were well that this should be clearly understood and frankly acknowledged. In the nature of things, our knowledge of the actions of drugs and of the modes in which they act on the healthy organism, must of necessity be more or less general, uncertain, vague indeterminate. The great sympathetic and its ganglia, the pneumogastric nerve and its many branches, together with the spinal cord and its system of reflex nerves, its nerve-ends, and the vaso-motor system,—the proper functions of which are in many respects obscure,—have, more or less, to bear the chief burden in solution of the actions of drugs. The very ground on which many of our explanations rest, is itself insecure.

6. Further:—As to the *application* of this knowledge, such as it is, in the treatment of disease, how short a way apart from sheer experience can we go! For example, we know and can set forth in detail the several actions of Colchicum on the healthy body, its action on the heart and on the stomach and bowels and other organs—its full choleraic action; and yet this gives us no assistance in explaining how or why it is that it does good in gout. We know the several effects of Mercurials on the system; yet if it be really curative of secondary syphilis, can we say how it is so? And so as to Quinine in respect of Ague. We know the effects it produces on the healthy system. But do these

furnish any explanation of its power over ague? Perhaps we are on the eve of a discovery here. It has the power of destroying the lower forms of animal and vegetable life; and should ague depend on the presence in the blood or in the system of certain of these, we might then understand how that drug acts in "curing" it.

7. In some cases indeed, perhaps in not a few, we can connect the physiological action with the curative effect. Of this I gave you some examples in my last lecture. Let me adduce here a few more in illustration of it. Strychnia stimulates the motor centres and motor nerves, and through these or through the blood the muscles also; and thus acting we can understand its remedial action in certain forms of functional paralysis. Wine, if not nutrient, stimulates the nervous system, and through it the heart, and we can thus understand its use in supporting the *Vis Vitæ* in fever. Chloroform abates or suspends consciousness, and more or less completely the sensibility to external impressions; and it thus serves many important purposes in our Art in a way that is quite intelligible. Ergot induces tonic contraction, not of the uterus only, but of the non-striated muscular system generally; and doing this we see how it is useful in atony of the pregnant womb as in many cases of hæmorrhage, perhaps in cases of inflammatory congestion. Full general blood-letting, by depleting the vascular system, promotes the process of absorption, and thus aids in the removal, even the rapid removal of certain dropsical affections, besides aiding the action of diuretic drugs. And the like holds often of the free purgation of the bowels. Belladonna dilates the pupils of the eyes and thus aids the vision in cases of cataract. And so of others.—But if one will be at the pains to go over the materia medica in detail, he will find, whether he be astonished or not, as to very many of its articles, that we cannot at all, or with any real satisfaction, connect their known physiological action with their known or their supposed curative use in disease.

8. One other remark I have to make in regard to the physiological action of drugs, which is often a source of perplexity. It is this, that many drugs differ in their action, and often very widely, under *different circumstances.* Nor is this always adequately represented by writers on the materia medica, while it gives rise to some of the conflicting statements we meet with in the books. Take *opium* for an example. Let one take it at bedtime and yield himself passively to its influence. As a rule, it will induce sleep. But let him take it in the daytime, and then apply his mind intently to any object of thought: it will not only not induce sleep, but it will enhance the power of the Will over the train of thought, and make his mind more active and energetic. Again, and more remarkably, the action of the *Oleum Terebinthinæ* is singularly varied according to circumstances, according to the dose or mode of exhibition or application, and the surroundings. Purgative it is in full doses, and somewhat inebriant also: failing to act on the bowels in such doses, it is powerfully irritant to the kidneys and bladder, causing painful and incessant micturition,—suppression of the urinary secretion, and inducing hæmorrhage from the kidneys. Tonic it is

said to be in small doses:—and notably, it is astringent, repressive of hæmorrhage; diuretic also, increasing the flow of urine. Diaphoretic also it is; and powerfully counter-irritant. Scarcely if at all less varied are the actions of *Ipecacuanha*. Emetic or nauseant only, according to the dose, and yet, in very minute doses, according to some, repressive of vomiting: irritant locally to the skin when continuously applied to it in the form of powder; and with some persons, when inhaled, irritant to the lachrymal glands, the 5th nerve, and the bronchial mucous membrane, repressing its secretion, while augmenting the flow of tears: irritant also to the muscular fibres surrounding the smaller bronchial tubes, inducing frightful dyspnœa followed after a time by a copious exudation of mucus, and complete relief of the spasm; aperient in minute doses, and yet in full doses repressive of the excessive purging in the acute dysentery of the East, with copious mucous secretion from the bowels: sudorific also it is in some degree; and it is said to be expectorant. A singular variety of actions we have in these two drugs alone—illustrative of the difficulties that attach to our inquiries—in this department of research, and the practical applications of our knowledge.

8. But enough. What I wish to impress upon you is the unsatisfactory state of much of our knowledge of the materia medica, and this arising from causes which the wit of man cannot obviate. The vital relations of drugs to the organism are so varied and so contingent as to be a perpetual source of uncertainty; and when we come to study their behaviour under disease we have

the irrepressible *vis medicatrix* accompanying us all the while in the observations we make, and perplexing us in the inferences we draw from the facts observed. How can our science of Therapeutics ever be other than more or less uncertain and unsatisfactory?

9. There is still a good deal that I should like to say in regard to the Materia Medica, and in favour rather than in disparagement of it. I might refer to the unquestioned power of Arsenic, Zinc, and Strychnia over certain nervous affections,—over Chorea, Hooping-cough, certain forms of functional paralysis, and over certain states of general ill-health, and of Bromide of Potassium over Epilepsy. And I might refer to the promise or the prospect we have of discovering effectual remedies in the Calabar Bean, *rightly* administered, in Chloral, in Hemlock, and others for the repression and cure of Tetanus. Do not, I pray you, imagine that I wish to *disparage* the Materia Medica. But when it has been unduly extolled on the one hand, and unduly maligned on the other, one is in duty bound to let the truth be known, and to point out the difficulties that lie in our way in our search after truth in this department, and which will ever prevent our science of Therapeutics attaining to anything like certainty.

10. In concluding what I have to say in regard to the Materia Medica, I shall advert to two points which I think well deserve the careful consideration of all teachers of the branch, and not less that of all writers on it.

11. The *first* is, the *conflicting* statements we meet

with in regard to plain matters of fact as to the actions of drugs, and especially of the more powerful and most important ones. Let me cite one or two instances. It is said by some as to Digitalis, that when it proves rapidly fatal, as when given in poisonous doses to the lower animals, it does so by inducing tonic or tetanic spasm of the heart, and that after death the heart is found rigidly contracted on itself, or in a state of spasm, and quite empty of blood. And this idea of its action is the basis of its use, as a cardiac tonic or stimulant, in certain forms of heart disease, and as a diuretic in certain forms of dropsy arising therefrom. By others, however, it is said and confidently affirmed, on the ground of actual experiment, that Digitalis has no such action on the heart, and that after death from it, this organ is found, and invariably found, in a state of complete relaxation, and containing more or less blood in its cavities. Here is a manifest contrariety as to a plain matter of fact. It should not be difficult one would think, to reach the truth in regard to it.*

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* —"Dans toutes nos autopsies d'animaux morts par la Digitale, nous avons toujours trouvé le cœur en etat de relâchement, renfermant à peu de chose près la même quantité de sang dans chaque ventricule. Nous n'avons jamais trouvé la cœur en etat de contraction tétanique (comme c'est la regle dans des intoxications biliares) et toutes les fois que nous avons eu l'occasion d'examiner un cœur peu de temps après la mort, nous avons pu constater par la pile électrique que le muscle cardiaque n'avait pas perdu sa contractilité."

"*De l'action de la digitale comparée a celle de sels biliaires sur le pouls, la tension artérielle, la respiration, et la témperature.* Note de MM. Feltz et Ritter. (Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences. Tom. 23, Juin 5, 1876, p. 1343)."

Take another instance. It is said by Sir Robert Christison, Dr. Pereira, and Sir Benjamin Brodie, that Prussic acid may prove fatal in the way of Coma, and that death may be averted by the artificial respiration. And indeed the experiments of Sir Benjamin conclusively show that it may. On the other hand, it was for long averred by Dr. Garrod that it proves fatal (virtually) in the way of Syncope by a sudden arrest put by it on all the functions of the living body, and without marked effect on any special organ. This statement of Dr. Garrod's was too exclusively put. In the last edition of his "*Essentials*" however, (the 4th) he seems to me to have set the matter on its right footing. He there states that the undiluted acid may prove almost instantaneously fatal as a direct sedative, *i.e.*, by Syncope; and that the diluted acid in a dose sufficiently poisonous to prove fatal, may kill by inducing Coma, while yet this result may be obviated by the artificial respiration. Yet for many years Dr. Garrod allowed a too exclusive or one-sided statement of its action to stand in his valuable work.

12. The other point to which I wish to call your attention is, the *want of precision* we meet with in our books in regard to the physiological actions and the therapeutic uses of individual drugs, and the frequent blending of the *incidental* and non-essential with what is truly *essential* and important. One author dwells specially on one set of actions, another on another set, and they do so in widely different degrees of detail. This holds no doubt of the expositions given in different

works of almost every subject; but it seems to me to hold particularly of the Materia Medica. It may be so far unavoidable,—inherent in the very nature of the subject. Nevertheless, it is a misfortune for the students of it. Eighteen years' experience in the teaching of it has satisfied me that, in respect of a subject so many sided, and abounding as it does in minute, isolated facts, it would be well if writers on this branch would have special regard to the *relative* importance of every fact, real or assumed, in regard to each article treated of, presenting the facts in the order of their importance, and marking them off under specific heads and subheads. This may seem a paltry remark. I am well persuaded, however, that in the unfolding of such a subject as the materia medica, the setting up of milestones and finger-posts on the road the students of it have to traverse, would be all important to them. Sir Robert Christison, it is reported of him, once remarked, and very truly, that nothing is easier at an examining board than to reject a candidate trained at a different school from that at which the examiners had themselves been trained. This holds, I believe, very particularly of the Materia Medica. It ought not so to be. But it will serve to illustrate what I have said as to the discrepancies that obtain among writers on this branch, and the need there is on the part of all of them to formulate their instructions in it with the utmost possible precision.

13. In now bringing to a close my remarks on the sphere of Art in the Cure of Disease, I would only observe

further, that I am very sensible that on many points I have laid myself open to adverse criticism. Yet it could scarcely have been otherwise,—unless I had been prepared to go along with the prevailing current. I can truly say, however, that in traversing this wide field,—one abounding in pitfalls,—I have striven to walk as facts directed me,—not seeking to shape my facts, but to take them as I found them—in their naked reality and unvarnished.—I have said nothing purposely in derogation of Art, or other than facts warranted. And, as I shewed you in my last lecture, I am at least quite abreast of Dr. Bristowe in my general appreciation of the powers of Art.—All through, my great object has been to shew you the *actual* footing on which our science of Therapeutics stands,—that you may neither overrate it on the one hand, nor, on the other, underrate it. Our science of Therapeutics must in the main be such as our science of Pathology makes it. Such as Disease is, such will Cure be. And this, will, I hope, clearly appear if we consider, as I purpose doing in my next lecture, what Disease is, and what its relation to Health.

LECTURE SIXTEENTH.

Health and Disease only Relative States of one living organism. Diseases not Entities, but only natural modifications of the state of Health. And Recovery is the organism reverting by its own inherent powers to the state of Health. A positive or categorical Definition of Disease impossible. The living body a Unity, and its vital powers the same in Health, Disease, Recovery.

1. It will perhaps conduce to a better understanding of the matters treated of in my former lectures and also of those to be treated of in lectures yet to be delivered,—if now, midway in our course, we consider carefully what is the true relation in which Disease stands to Health. If we can but reach the truth as to this we shall have no difficulty in understanding the real footing on which the science of Therapeutics stands, or the relation in which disease stands to Art. In a former lecture I laid before you the views entertained by Sir John Forbes as to the nature of both these relations. But it may be profitable to consider the subject again and from an independent point of view.

2. Health and Disease, then, are, I apprehend, simply, *relative* states of the living body. Both of them are in the truest sense *natural* conditions of the organism,—or conditions naturally attaching to it by its make and constitution. They are merely relative

modes of action of its inherent powers, forces, or energies,—relative manifestations of its vital actions. In both Health and Disease it is the same vital powers that are in operation, the same vital actions that ensue, the same vital phenomena that appear,—normally, in the one, abnormally (as we say) in the other, yet naturally in both; while, moreover, the normal passes so gradually into the abnormal, and the abnormal repasses so gradually into the normal, as to nullify all attempts rigorously or logically to define either. Not being different things, but only modifications and natural modifications of one and the self same thing,—namely, that of Life, no categorical, express, or absolute definition of either, although it has often been attempted, is possible. And this consideration should of itself go far to shew that the Cure of disease, however it may be aided by Art must be primarily and essentially the work of Nature and of Nature alone, that is to say, the work of the organism, itself reverting from the abnormal to the normal exercise of its powers. Strange it is, that a matter so simple should not be at once and clearly seen by all.

3. The misapprehension and consequent confusion comes in great part from our making *Entities* of diseases, from our raising them to the rank of "*natural history*" objects and describing then as if they were such. Practically indeed this is unavoidable. It is requisite for practical ends that we do so, and that we give names to each disorder and depict the natural history of each. But then this very necessity tends to mislead us as to the real nature of the relationship that

subsists between the two states of Health and Disease. And this misleading effect assailing us in the days of our pupilage often exerts a baneful influence over us all our lives through. Even the most enlightened among us can scarcely divest himself of the notion, in the daily routine of life, that in treating a pleurisy, or a pneumonia, or a typhus, or a scarlatina, he is not dealing with an entity, whereas he is in fact only dealing with vital processes that are in their own nature natural to the body but which from this cause or that are going on for the time being in a manner more or less unsatisfactorily. And this is true however grave the abnormal processes may be, nay even should they end fatally.

4. In illustration of this, let us take the case of a blow on the pit of the stomach. It may prove almost instantly fatal, and on examination of the body after death there may be nothing abnormal to be seen anywhere. How simple the deviation here from perfect health, yet how dire the result of it! Is that affection, which may be said to have no clinical history, a Disease? Compare such a case with the effects produced by a perforating ulcer of the bowel. In this case, there follow phenomena which together constitute what we *do* regard as a Disease, and to which we assign a place in our systems of Nosology. Peritonitis we call it. It proves rapidly fatal and the fatal event is precisely analogous, as to its mode, to that from a blow on the stomach; and after death there may, virtually, be as little to be seen inside the belly, that can be regarded as abnormal or morbid, as in that other case. For it is

sometimes fatal before there is time for inflammation to be set up. And so of Arsenic. In moderately fatal doses, it induces gastro-enteritis—a disease which kills as Peritonitis does. Yet in excessively large doses it may be fatal from a sedative effect on the heart, produced through the nervous system, which necroscopy can take no note of, and produced before gastro-enteritis can be lighted up.* We have here four sets of cases all proving fatal in the same way,—namely, by a depressing effect on the heart's action. Yet as to the resulting phenomena, it is those of two of them only that we regard as constituting what we call Disease. The other two we speak of as *Injuries*. But what is the difference between an Injury and a Disease? It is not easy to answer this question. Pathologically there no difference between them. The distinction is mainly a physiogical one, or, if this distinction will not stand on theoretical grounds, it is a *practical* one, which our common sense recognises. Cases of severe and rapidly fatal injuries may be said to hold a middle ground between Health and Disease,—between Physiology and Pathology; and the study of them serves well as I will point out to you in my next lecture, as an admirable introduction to that of the more difficult subject of Disease. So also

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"There is a class of cases, rare indeed, yet sufficiently attested, where the arsenic exercises its powers primarily and exclusively on the nervous system, the patient dying, often rapidly, in a state of profound collapse (or coma?) and no local lesions whatever being found in the stomach or bowels" (*Report of the Medico-Legal Returns in the Bengal Presidency during the years* 1870, 71, and 72, page 252. By Robert Harvey, M.B., Surgeon, Bengal army). Cases illustrative of the above are given in the Report.

when severe injuries are spontaneously recovered from, as often happens quickly, the study of them serves well to illustrate the natural cure of Diseases. They serve, too, to shew how difficult it is to draw the line between Health and Disease, or rather, how impossible it is to draw any such line. For, considered in the abstract, they are quite as much diseases as inflammation is, or as small-pox is.

5. It is here, and here especially, in attempting to define what Disease is,—to draw the line between it and Health, that we are misled and cheated by words,—by the name we give to things. Often there is no help for it,—or it is unavoidable. Still the fact holds true that we are often led astray by the very instrument by which we think,—and not seldom in matters of the highest importance. Here, in this matter of Disease and its relation to Health, as well as in that of the relation of Disease to Recovery, we are all exceedingly apt to be deceived and in such manner as to have our fundamental conceptions of them vitiated.

6. The truth is, that the living body is so constituted as to *tend* always to act agreeably to the manner intended by Nature. It is so. And when thus acting the state of Health obtains. Yet it is so constituted as to be *liable* to act otherwise. Now if we are to be guided by formal logic, and to be rigidly consistent in the use of words, any deflection however slight arising out of that liability ought to be designated Disease. But our common sense rebels against pedantry of this kind. The word Disease is itself a definition—a negative one indeed, of the states of the organism included

under it. Yet in its technical and also in its popular sense, it means something more than this. The state of the Eye induced by a mote in it which the tears will presently dissolve or wash out, is very much the reverse of one of Ease. It is truly one of Dis-Ease. But we do not call it a Disease. Again: Let a Bee sting the upper eye-lid. Uneasy to a degree the sting itself will be; and it will give rise to such an amount of inflammatory swelling all around as shall effectually shut up the eye for a day. Is this a disease? It has all the elements of one, and of one too that might be rapidly fatal. For, let the Bee, circumstances favouring its doing so, get within the mouth and plant its sting in the mucous membrane lining the chink of the glottis. Here the same result will follow as when the insect fastened on the eyelid. In this case, however, the result will be rapidly fatal unless averted by a surgical operation. Is *this* kind of œdema of the glottis a disease? If so is the trumpery œdema of the eyelid one? Be this as it may, the one has a place in the Nosology; the other has not. I spoke a little ago of the distinction between an Injury and a Disease,—a distinction which we practically recognise. Yet here we have an instance of one and the self same kind of affection being in one case a mere Injury and a trifling one,—in the other a Disease and a dangerous one,—the seat it occupies making the sole difference between the two. It is an instance of a distinction and a real one without an essential difference; it is a difference in the sense of "the case being altered, that alters the case."

7. Again; The circumstances in which the organism

when severe injuries are sp[illegible] in harmony with its
as often happens quickly, [illegible]ted modes and ends of
to illustrate the natural c[illegible]y are such as that they
too, to shew how difficul[illegible]juriously on it. And in
Health and Disease, or [illegible]ked, the most general, the
draw any such line, [illegible] or exciting causes of the dis-
they are quite as mu[illegible] those "which result from the
as small-pox is. [illegible]stence."

5. It is here, [illegible] of what has been said,—and
to define what Dis[illegible]ed still further in illustration of
and Health, that [illegible] how closely the two states of
by the name we [illegible] are linked together. The saying
for it,—or it [illegible] the pot" means that the food we
that we are of[illegible] we drink, the wherewithal we are
which we think we breathe, the heat and light by which
highest impo[illegible] made warm, may at times, in the most
and its relati[illegible]possible, induce such changes in the or-
lation of D[illegible]all incommode us grievously, or afflict us
apt to be[illegible] life a burden to us, or bring us speedily
fundam[illegible]ive,—and yet in ways which the Nosologist
6. Th[illegible] take no account of. So true it is that "in
as to [illegible] of life we are in death."
inten[illegible] two states, then, of Health and Disease, are
the [illegible]ly different things;—still less are they the
as t[illegible] of one another,—things specifically different
gui[illegible]og is from a horse. In all cases, Disease is pri-
th[illegible]ly an affection of some one or more or of all the
ou[illegible] powers of the organism (powers reducible to three
B[illegible]four in number),—that affection modifying certain
[illegible]al actions, and shewing itself in a modification of
[illegible]al phenomena. But it is an affection, modification,

and manifestation of the very same phenomena, the same actions, and the same powers as are natural to the body, and which when acting and manifesting their actions naturally and with *ease*, constitute the state or condition of Health. The vital powers may be variously affected and widely diversified in their acting and their manifestation; but the state of Disease implies no new or additional powers, no actions or phenomena other than those that attach to the organism in the state of Health. In Tetanus, for example, what have we? An affection of the power of *Contractility* inherent in the muscles; inordinate muscular action as the result, and muscular spasms as the ostensible phenomena. No doubt the vital power of *Innervation*, inherent in the nervous system, is involved also, and is the primary affection, in its turn, however, implicating the contractile power; while the power of innervation is in its turn again acted on by the contractile, as seen in the pain, the horrible pain naturally induced by the spasm. But we have here no new powers, actions, or phenomena. And when Tetanus is recovered from, we have simply these two vital powers of innervation and contractility reverting to their normal condition and their normal mode of action. And so of other diseases or diseased states.

10. A clear conception of the true relation in which the two states of Health and Disease stand to one another, while it would conduce to a clearer apprehension of what they both are, would shew us also how futile it is and ever must be to seek to define them in any other than in very general and these *relative* terms.

Many attempts have been made to give a categorical or a positive definition of Disease, or of what Disease is; and amusing it is to read some of these definitions. Wide of the mark, or a mere play upon words, some of them are, and they might well be disregarded were they not misleading to students. One definition we have of it which is perhaps as good as any that may be given: "we call all states of the living body diseased in which there are such deviations from its natural condition as cause suffering or inconvenience, or endanger life." Here no attempt is made to define it in the abstract, or in a positive sense. It may be open to much verbal criticism. What amount of suffering, or what kind or degree of inconvenience constitute Disease? The definition would include and make a disease of what I formerly said we do not speak of as such, namely, a blow on the pit of the stomach, the sting of a bee, or a mote in the eye. The definition, however, is of a piece with what is implied in the word Disease itself. Dis-Ease.

11. Health and Disease, in short, are merely varying conditions of one and the self-same living organism; and Recovery, it may be added, is nothing more than Health regained—and regained through the organism itself by the exercise of its own inherent powers. What is there of mystery here? And what value can we attach to any system of Therapeutics which is not based on an exposition of the curative powers of the organism? "*Similia similibus curantur,*"—the Hahnemannic dogma, is true in a sense not referred to (as

far as I know) by Hahnemann and his disciples. Like cures like in M. Gubler's sense. For it is the organism that is its own healer. Disease is so like to Health that the powers concerned in it are themselves adequate to the Cure of it. How like the *similia* to be cured are to the *similibus* by which they are cured? How like the curative and curing *similibus* to the ailing *similia!* The subject and the agent in both, the same vital powers! Is this Hahnemannic doctrine also? If not, then, according to the Homœopathic school, we have Nature giving man a law to work by which she does not herself obey.

12. In truth, the living organism is a UNITY; and its vital powers the *same* in Health and in Disease,—the *same* also in Recovery, which is but Health regained by the operation of these powers. This will perhaps more fully appear in my next lecture.

LECTURE SEVENTEENTH.

The subject of the Relation between Health and Disease continued. The simplest Forms of morbid action and of morbid processes to be found in the phenomena of Cases of Violent Injuries and Sudden Death. Importance of the study of cases of this kind in relation as well to Pathology as to Therapeutics. Reference to Dr. Alison's Exposition of them, and to Dr. Latham's Reflections on them.

1. The question still is—What is the Relation in which Disease stands to Health, and what the Relation of Disease to the Recovery of Health.

2. In this lecture it will be my endeavour to deal with our subject in a more concrete form than I did in my lecture of yesterday. I will make it my business to shew you that there is one mode of looking at diseases which is well fitted to demonstrate how intimately linked together are the two states of Health and Disease,—how natural a thing Disease really is, and, no less, how natural is the transition from Disease to Health.

3. It is well remarked by Dr. Alison, in regard to the "diseased conditions" of the living body (or in regard to what we call Diseases), that "the fewer and more comprehensive the ultimate facts" to which we can reduce the complex facts included under them, "the

more successful we shall be in acquiring a satisfactory knowledge of what those conditions are." And he next remarks that the "simplest exemplification of those ultimate facts is to be found in Cases of Sudden Death and in the action of Violent Injuries." And agreeably to these views, and in reference to his own plan of unfolding the science of Pathology, he prefixes, as introductory thereto, an account of the different fatal injuries to which the living and healthy body is liable. (*Outlines of Pathology*, 1833, and of *Pathology and Practice of Medicine*, 1844).

4. The Cases here referred to are such as these:—Sudden Concussion or Compression of the Brain; Excessive Hæmorrhage, sudden or gradual; Suffocation, Drowning, Hanging; the sudden application of extreme Heat or Cold; Lightning; Starvation; Poisons of various kinds, &c. These he treats of in detail in that *unique* Chapter of his in his Pathology, entitled—"Of Sudden or Violent Death."

5. The method there pursued of studying those deflections from Health which we call Diseases, is one of inestimable value to young students of Medicine. It is the best introduction they can have to the more difficult because more obscure subject of Disease. And it is of real importance in relation to the purpose of these lectures.

6. The late venerable Dr. Latham of St. Bartholomew's, fully appreciated its exceeding value. In a style peculiarly his own, and with singular force and clearness, he gives full expression to that appreciation. And what he says on the whole matter bears so directly

on what is now in my view, that I cannot but cite it in detail. I can have no better text from which to address you to-day. It will be the key-note of this lecture.

7. "I know no department of public teaching which, if it be entrusted to good hands, promises more benefit to medical science and medical practice than this. It undertakes to illustrate the modes in which injury, disease, or death arise from those external agents or accidents that are most signally hurtful to animal life: —from poisons of every kind; from lightning; from hanging and drowning; from corruption of the air; and from every method of simple violence. It is conversant with all the highest points of physiology and pathology; and its very purpose requires the greatest exactness in the nature and display of its proofs. It requires, in truth, that they should be so made out as to be obvious to such understandings as ordinary men are accustomed to bring with them to the jury-box. Here then is provision made, within a large and interesting field, for demonstrating to you the effects of external agents as the causes of diseases, and all *matters of fact*.

"The display (he adds) of the fatal effects resulting from the causes enumerated to several vital parts and organs, furnishes so many demonstrations of the possible ways in which the same parts and organs are capable of suffering from causes less hurtful. Not long ago, poisoning was an affair of the utmost darkness and mystery; but now the rationale of poisoning in its [illegible]ral kinds is so well made out, that I am able to refer to it for the best instances which pathology affords of cause and effect in the manifold influence of external agents and accidents for the production of disease.

"Poisoning and the severer injuries are *a sort of pathological experiments*. They produce upon this or that organ all the phenomena which any conceivable disease can exhibit; and they produce them in the *greatest simplicity*, because the subject is often previously in a state of health. Thus it is that they furnish an admirable introduction to the study of what is called spontaneous disease in the same organs." (*Lectures on Subjects connected with Clinical Medicine*, 1836, pp. 125, 6, 7).

8. Nothing more true. Nothing could well be more happily expressed. The quotation is a long one. Yet having regard to the intrinsic merits of it, and to the author of it, one of the wisest and ablest men of his day, the bosom friend moreover of the venerable Sir Thomas Watson, I do not hesitate to give it you in all its fulness. To me, it has ever seemed to be worth its weight in gold. The study of such cases is indeed the best possible introduction (acquaintance first made with Physiology) to that of the complex and multifarious phenomena of idiopathic Disease. It serves also to illustrate many of the first principles of Physiology itself, and not less the first principles of Therapeutics also.

9. For, indeed, the cases in question, happily designated "the simplest cases in pathology," occurring in [illegible] previously in perfect health, can scarcely be [illegible] cases of disease at all, in the sense at least

in which the term disease is commonly understood. Anyhow, if they must needs be so regarded, they are cases of the least complex kinds or forms of it. The changes induced in the vital organs, and intervening between the application of the external cause and the fatal event, or the consummation of the effect which rapidly follows, must necessarily be *few* in number and *simple* in their character. The phenomena too which accompany the internal changes must be equally few and simple; and for the most part *characteristic*. And the physiological relation between the external cause and the effects produced by it on the vital organs can have nothing occult in it; it is direct; and it will be open to the observation of everyone at all conversant with physiology.

10. It is widely different often with what we call Diseases. Arising frequently from unseen or inappreciable causes, and often terminating fatally in modes that are complex or obscure, they extend over a longer period of time, consist of a longer series and a greater variety of internal changes, involving many different vital actions, and shewing themselves by symptoms which vary in the progress of time, and are modified by the circumstances or the surroundings of different patients. Amid such a multiplicity, complexity, and diversity of changes, it is often exceedingly difficult, nay even impossible to discriminate between the *essential* and the *incidental*, to trace the connection between causes and their effects, or to acquire clear notions as to the real nature, or the true import of the phenomena we witness.

11. This being the case, it is easy to understand how it is that we should often be unable from the observation of diseases themselves, to form a correct judgment of the nature of many of those that come before us in actual practice. But this difficulty may often be greatly obviated or entirely removed by a careful comparison of diseases with the known effects of violent or rapidly fatal injuries, such as those of the kind already enumerated. These simplest cases in pathology will furnish us with facts and principles, or with analogies and illustrations that admit of an easy and a direct application to morbid processes and morbid phenomena. They hold, it may be observed, a *middle* ground between Physiology and Pathology. Unsound states of the organism they are, yet they are not what we are *used* to look upon as diseased states of it, or as diseases, or such as we give a name to and assign a place to in our systems of Nosology. They thus serve to shew us how intimately linked together Health and Disease are.*

12. Moreover, when such cases of violent injury are recovered from, they still serve to teach us the same lesson. They not only shew us how natural a thing disease is, how it is merely a modification of Health, but also how natural a thing Recovery is, how it is an affair of the organism itself, occurring often independently of Art, albeit Art may often more or less effectually come in aid of the organism.

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* This distinction seems to be pretty generally recognised—popularly, as may be seen in newspaper obituary intimations, *e.g.*, "killed" in action, or by a fall from his horse, or "drowned" by falling overboard, or while bathing, as compared with "died" from typhus fever.

13. We often complain that many of the phenomena of disease are *inexplicable;* and there can be no doubt that the obscurity that attaches to many diseases goes far to beget in our minds wrong notions as to what Disease really is,—leads us to look upon diseases as something radically distinct in themselves, and diametrically different from Health or the opposites of it. But (as has been well remarked) we are too apt to forget that nothing in Nature is explicable except in as far as it admits of comparison with things that are simpler and more familiar. Now the things simpler and more familiar with which morbid phenomena may be compared, and by a comparison with which they may be explained and understood, are very few. Physiology, indeed, helps us greatly, by informing us what functions of the living body are disordered, in what manner they are altered, and how their alteration affects other functions. But this allowed for, it would be easy to shew that there are many facts in regard to the operation of external causes on the human body, and the modes of diseased action assumed by its different organs, which could not possibly be cleared up to us by any knowledge we possess of the healthy actions of the system. (Alison).

14. The simple cases, however, now in view, the simplest in pathology, avail largely to clear away the obscurity attaching to morbid processes and morbid phenomena. The effects of violent injuries, of blows on the head or belly, of excessive loss of blood, sudden or gradual, of suffocation, of poisons, &c., present phenomena that bear a very close resemblance to those that

occur from unknown or imperfectly understood causes; and when the former are successfully arranged and generalised, they will afford more assistance than all other means put together, in explaining the more complicated changes which give rise to the latter.

15. Let us now look at a few of these simple cases. And let us take first, as the simplest of all, those in which the injuries inflicted are of a purely mental kind. A wife hears unexpectedly of the sudden and it may be the distressing death of a much loved husband, or one hears unexpectedly of a sudden reverse of fortune, or of a sudden accession of fortune. The impression on the mind is such and so great that the person affected at once swoons away, falls down, and dies, or, after being to all appearance dead and really within an ace of death, gradually recovers. Many such cases are on record. Mr. Travers (in his Work on Constitutional Irritation) quotes from Sir Astley Cooper's Lectures, a case which seems to have been as to its essence of a mental kind. It was one of instant death by collapse following the sudden transition from agonising pain of some days' duration to perfect ease, on the opening of a thecal abscess. Odours at once strong and peculiar, are said to have occasionally a like fatal effect,—or an effect nearly approaching such a result. We are more familiar, however, with cases of this kind as resulting from physical causes; and one of the simplest of these has been repeatedly referred to in these lectures, that, namely, from a stroke on the pit of the stomach, unattended with rupture or other organic lesion, instantly

issuing in death, or after apparent death gradually recovered from.

16. Again :—One has a large artery wounded ; the blood gushes out ; in a few seconds he becomes giddy, pale, and faint, perhaps he sickens and vomits. By the large, and still more by the sudden loss of blood, the nervous system has received a shock ; this shock reacts on the heart enfeebling its action ; and to the state of one or other of these two organs the phenomena indicated are due. The bleeding continues ; and within a few seconds more the sensibility fails altogether, and the pulse is imperceptible. The syncope is complete ; the heart's action is suspended, the circulation through the brain is arrested, the consciousness is gone ; and if the contractile power of the heart is extinct, the syncope is fatal. Yet, even when the syncope is complete, recovery may follow. After a time (the hæmorrhage ceasing) the pulse becomes perceptible, the patient draws breath, opens his eyes, and regains his consciousness. Eventually he gets quite well, and perhaps under circumstances that precluded any restorative means being resorted to.

17. In these examples of Syncope from hæmorrhage, or from a blow on the stomach, or from mental states, how short is the series of changes between the first and the last, how simple their character, how obvious their relation to their respective causes, and how clearly referable the syncope in all of them to the sudden failure of the heart's action, or the recovery from it to the heart spontaneously resuming its action.

18. Take another case :—From some cause obvious

in its nature, a person in perfect health suffers loss of blood. It is never at any time, albeit it may be large, such as to induce syncope. But the hæmorrhage is recurrent, recurring from time to time. He becomes pallid, he is reduced to a state of extreme weakness. Yet he retains his consciousness *throughout*, up, if the case be fatal, to the last moment of life. Still, should the hæmorrhage cease permanently, he may recover perfectly. Here also is a simple case in pathology. The speciality of it attaches to the circumstance that, all through, the consciousness is retained. The explanation of it is easy. The loss of blood although excessive, has never at any time been such as materially to interfere with the circulation through the brain. As intermediate between this case and the former set of cases, we have in some cases of metallic poisoning, rapid and fatal depression of the heart's action, with perfect retention of the consciousness, and in which, on examination of the body after death, nothing that can be regarded as morbid, is to be seen in the stomach or any other organ.

19. These simple cases might be largely multiplied. One is, the effect of opium:—in a moderate dose it produces natural sleep; in a dose unduly large it induces deep sleep, which however will be awakened from naturally in a short time; in a still larger dose, it may induce such profound sleep (stupor we then call it) as shall prove the sleep of death. Yet even in this case, a fatal result may be averted by means of the artificial respiration, this simply enabling the patient to breathe until he has had time to sleep through that

deep and otherwise fatal sleep. How simple the link here between the normal and the abnormal,—between Life and Death! Reference may be made here to Mr. Clyne's famous case of deep sleep of more than one year's continuous duration. The patient, a sailor, was wounded in the head in an engagement off Minorca. He was taken to Gibraltar, and lay some time in the hospital there. After a time he was brought to England and eventually taken into St. Thomas's Hospital. For more than twelve months, this man's life was a complete blank to him. He was insensible to all surrounding objects, and quite incapaple of holding converse with those about him, his attendants simply knowing by certain instinctive movements made by him how to relieve his natural wants. On examining his head, Mr. Clyne found a fracture with depression of one of the parietal bones. He raised the depressed piece of bone. Almost directly the man awoke,—woke out of his long, deep sleep, for such it seems more naturally to have resembled than what we call stupor or coma, Unconscious as we are during sleep of the lapse of time, it would be interesting to know if on this occasion the man felt otherwise as to time, than he must often have done before on waking from an ordinary sound sleep. He had been asleep for more than a year. Did it appear more than a night? Probably not. But this by the way. Cases like these are surely on the borderland between physiology and pathology. Was this sailor's case actually one of coma or sleep? It seems to have had all the features of the latter, only deeper than usual. He seems to have breathed naturally all through it, and no mention is made of stertor as accompanying it. And in the case of the *sleep* induced by opium, what is the difference, as regards the state of the Brain, between that degree of it which, although deep, shall be slept through naturally, and that which shall not be thus slept through, but will naturally be fatal?

20. In short, the *ratio causarum*, the ratio *symptomatum*, the *ratio moriendi*, and even the *ratio medendi*, are easily made out in these cases, or easily as compared with many of the cases we regard as Diseases. They hold, as I have said, a sort of middle ground between physiology and pathology, a ground common to both. In these simple cases, we see diseases in their elementary forms; and we may learn from them how to interpret many of the obscure phenomena of disease which we might not otherwise see our way through, or see it but imperfectly. They may be said to be the Alphabet or Primer of Pathology. They lead us on step by step from the more simple to the more complex, and help us to discriminate between the essential and the incidental in pathology. They are stepping stones on which we may tread our way more securely than without them we should be able to do, to those states which we unhesitatingly look upon as diseases. And as well in themselves as in their issues, they show us how impossible it is to draw the line between Health and Disease, and between Disease and Recovery. Very many of them are far more perilous to life than not a few diseases are; and when recovered from they often indicate the lines on which the treat-

ment of many diseases should be based. Strange it is, that, as well on their own account or for their own sake, as for the purposes they serve as an introduction to the sciences of Pathology and Therapeutics, the study of them should not be more cultivated than it is, except in relation to Medical Jurisprudence,—a branch which most students regard as a speciality, which they are never likely to follow out in practice, but which they must "get up" sufficiently to enable them "to pass" for their degree or license.

21. In concluding this lecture, permit me to refer you to volume xxvi. of the *Edinburgh Medical and Surgical Journal* (1826, pp. 311-354). You will find there an able Review of Mr. Travers' well-known work on "*Constitutional Irritation.*" This review deals largely with the subject of this lecture, and with the first principles of pathology, in a manner singularly happy; and it abounds in illustrations drawn from cases of the kind now in view. I cannot, I am sure, do you a more real service than in bringing that review under your notice and urging you to read it carefully. I have availed myself largely of it in this lecture.

LECTURE EIGHTEENTH.

On the Modes and the Processes of Healing and of Recovery, as occurring Spontaneously in Disease—or independently of Art. (i.) *All morbid action of temporary duration only: this fact has to be taken along with another fact (in Physiology), namely, that even in the state of Health all vital action is only of temporary duration, and also with these two other facts—(a) causa sublata, tollitur effectus—and (b) the inherent tendency of the organism to maintain and when out of gear to revert to the state of Health.—In conformity with these general facts, most diseases sooner or later subside of their own accord and pass away. Illustrations.* (ii.) *Spontaneous Recovery of impaired strength and vigour on the subsidence of Disease.*

1. We now at length reach what forms one of the main Heads of this Course of Lectures. It is the Modes and the Processes of Healing in Diseases, or of Recovery from them, as occurring Spontaneously,—or as effected by the powers of the living organism itself—independently of Art.

2. The study of this part of the Natural History of Diseases in relation to Therapeutics is second only in importance to that of the Modes and the Processes of Dying. I say second in importance. For it is very

manifest that in all those diseases or cases of disease in which Nature is herself competent to the cure of them, all we have to do in the treatment of them, is to aid her in her own curative work, or it may be, with arms folded, merely to watch her in that work—and simply in her own interests. In respect, however, of the matter of Dying, our business is the all important one of staving off death. In cases in which Nature is doing her best to bring about the cure and is to all appearance working well towards that end, we may have little or nothing to do, as in a case of Chicken-pox, or a mild case of modified Small-pox. In those, however, in which she bids fair to fail in that direction, —in which danger threatens,—in which we have reason to dread a fatal issue,—in these we have to bestir ourselves; we have to do what in us lies to tide our patient over the peril that environs him. And in order thereto, it is of the utmost consequence that we clearly understand the source and the nature of the peril,—in other words, the Modes of Dying, the means available to us for counteracting the danger and the right way of using them. The special value, again, of a knowledge of the natural modes of Healing, apart from that already indicated, namely, how best to aid Nature, is to guard us against an undue or meddlesome interference with her in her work, and also against self-deception in judging of the intrinsic merits of our own positive services or of the efficacy of our remedial agents, and thus avoid the mistake of appropriating to ourselves the credit due to Nature.

3. The subject of the Curative powers and proceed-

ings of the living organism is a large one. A systematic exposition of it in detail,—such an exposition as befits its manifest importance is much to be desiderated. All however that I can attempt is a mere outline of it,—one which I hope you will hereafter amplify of yourselves in the wards of the Hospital and in your private practice. In the Hospital you have a rich field wherein to study it; and I would beg you to turn to good account the opportunities you there have in this way.

4. It is obvious to remark that as the simplest cases in pathology, adverted to in my last lecture, give us the best and clearest idea of what Disease is, so these same cases when recovered from spontaneously give us the best idea of what Cure is. The cases themselves, severe and full of peril as they commonly are,—rapidly fatal as they often are, serve to shew us, as I have said, how natural a thing Disease is,—how it is a mere mode or mood of Health,—a casual deflection from it. So also, when, fortunately, Recovery follows of its own accord, they enable us to see how simple and natural a thing Cure is,—how little of mystery there is in it.

5. Accordingly, I might begin the exposition of my subject by going over one by one those simple cases as they stand in Dr. Alison's admirable chapter "of Cases of Sudden or Violent Death,"—a chapter which I would urge on you the careful study of. Their main value, however, lies in the illustrations they afford of the modes of Dying. When recovered from, naturally, this is commonly so speedy as to furnish few materials for special comment in relation to the subject immediately before us, while such as they do furnish serve

mainly to elucidate those more complex cases that constitute what we commonly speak of as diseases.

6. (i.) Now, with regard to the favourable tendencies of Diseases,—however simple, or however complex these may be,—with regard to the favourable terminations of diseases and the modes and the processes of Recovery from them. as occurring spontaneously,—the first and the cardinal fact that demands attention is,—the *temporary duration* of all morbid action, as a rule in pathology; while another and a co-relative rule or principle in physiology is, that the intensity or degree of most kinds of morbid action is, while it lasts, within the limits of *safety*, or, more precisely, within the powers of *endurance* of the organism as regards the maintenance of its own vitality. All morbid action is, as such, of temporary duration only. In some cases, it runs a tolerably definite course of days, or weeks, or even of months; and its cessation within a tolerably definite period may be more or less confidently reckoned on. In other cases, its duration is variable and more or less uncertain. Still, the general fact, if not in all yet in most kinds of diseased action is, that it tends to wear itself out,—to subside and pass away. And if, while running its course, its intensity be not in excess of the powers of endurance of the organism,—if its weakening or exhausting effect on the vital powers, and on that of the heart in particular, be not beyond what they can sustain,—or if no change be induced by it in any one of the organs the action of which is immediately necessary to life, of such a kind as to entail the suspension of the

action of that organ (as of the heart, or the lungs, or the brain), a spontaneous cure will be effected. Recovery will follow; Health will be regained.

7. This general fact is perhaps best illustrated by some of the simplest cases in pathology—so often adverted to. Let us take the simpler forms of sudden syncope. A female swoons away on hearing unexpectedly that a loved friend has suddenly died or met with some dire disaster, or one receives a violent kick in the belly, or a stroke on the crown of the head. Here there is a mechanical cause operating;—there a mental one. The result is the same. Sudden syncope follows,—the sufferer at once turns pale, becomes unconscious, falls down, and is pulseless. The effect produced may be fatal. Yet recovery may follow spontaneously. After a time the patient comes to himself and ere long gets quite well. What have we here? An effect which may have been within a hair's breadth of the patient's death. Yet it was *within* the powers of endurance of the organism; and being in its own nature of temporary duration, it passed away; and, as M. Gubler would say, the organism regained its equilibrium, as a thing of course.

8. Next, as regards the morbid actions which we specially speak of as *Diseases*, the general fact now before us, or, rather, the two sets of general facts, is well exemplified in the natural history of the idiopathic Febrile diseases. Look at Cullen's brief description in his Nosology of the natural Small-pox—how he gives us day and date for "the combination and succession," and the ending of the phenomena. "*Tertio* die *incipit*,

et *quinto finitur* eruptio papularum phlegmonodearum, quæ, spatio *octo* dierum, in suppurationem, et in crustas demum *abeunt*, sœpe cicatrices depressas, sive foveolas in cute relinquantes." He can even confidently give us the distinction as to time and form between the *Variola discreta* and the *Variola confluens*. So also as regards Measles: "*Quarto* die, vel paulo serius, *erumpunt* papulæ exiguæ, confertæ, vix eminentes, et post *tres* dies in squamulas furfuraceas minimas *abeuntes*." And so of others of this order of diseases. They all run a singularly definite course, and then subside and pass away; and if only, as already observed, the living organism can keep itself afloat while they last, all will in the end be well. And what a vast number of diseases this order comprises!

9. The same general fact is also exemplified in the Inflammations (the *Phlegmasiæ*), more especially the acute. An inflammation sets in; it runs a longer or a shorter course, as the terms acute, subacute, and chronic indicate. It is accompanied, or it is followed by its own proper products, educts, or results. But after a time the inflammatory process comes of its own accord to an end, if not prematurely cut short by death. It wears itself out. It may have worked mischief in the parts affected. But it subsides. And its special products or results themselves make their way to an end. Effused lymph, and serum, and pus have their limit. The ulcerative process too as a result of the inflammatory, comes at length to a standstill; and when inflammation leads to the death of a part, the gangrenous process in most cases stops of itself.

Further, the general disturbance of the system, the constitutional febrile state, induced by the local affection, subsides of itself on the subsidence of the latter. All these are facts familiar as well to the surgeon as the physician. Let me here cite one remarkable example of the essentially temporary nature of inflammatory action, and its tendency to a favourable issue. And let it be Pneumonia, a disease long regarded as one of the most severe and dangerous of its forms. The late Professor Bennett of Edinburgh, treated many successive cases of that disease, above one hundred I believe, with nothing more potent on the side of Art than suitable food and careful nursing, with nothing in fact to aid him other than the incomparable *Vis Medicatrix*. Yet they all, or almost all of them recovered perfectly.

10. These are facts in the natural history of two of the commonest kinds of diseased action (Fevers and Inflammations) of the utmost importance in relation to the science of Therapeutics and the practice of Medicine. We learn from them that Fevers and Inflammations, themselves the occasion of the far greater part of the mortality of mankind, are in their own nature temporary morbid states, springing up from their own proper causes, running a course more or less definite and of longer or shorter duration, and then subsiding spontaneously, the organism meanwhile holding its own—and in due time reverting to the state of Health. They point unequivocally to the organism as being its own healer.

11. And what is true of the Febrile and Inflamma-

tory diseases holds also more or less, yet very largely, of other diseases, of those variously designated Functional or Chronic, excepting always, meanwhile, the strictly Organic, and specially those designated Malignant. It holds of the congestions, the hæmorrhages, the dropsies, the profluviæ, and the neuroses, or of all these in as far as they are not due to irremediable organic disease. They are all of them in their own nature *transient* perturbations of parts or organs. They all wear themselves out: they last only for a time; and their course run, the hour of their departure comes, and Health is restored. For, as already observed, the inherent tendency of the organism is ever in the direction of health. This is the law of its constitution; and that tendency never lost (although it may be overborne) comes fully into play on the subsidence of disease, provided always that its recuperative powers, nutrient—and plastic—remain intact. On the subsidence of disturbance within it, there is a spontaneous recovery of strength and vigour.

12. This then is the leading fact in the natural history of diseases as regards their spontaneous decline and cure. The way in which it is accomplished may well be called a "provision of Nature" for that end. But this expression applies better to other modes of natural cure yet to be considered.

13. The general fact now in view, cannot, however, be said to hold universally. There are at least seeming exceptions to it. There are diseases (very few, however, they are *relatively*) which once set on foot continue indefinitely, and cannot be said to tend to a

spontaneous, still less to a favourable termination. Pulmonary consumption might be thought to be one of these. Yet, as the late Dr. Latham admirably pointed out, it is not really so. Leaving out of account, the cases in which its progress is finally stayed, and which are virtually recovered from this way or that, it is a disease which runs a tolerably definite course and wears itself out, just as in the case of a scrofulous (tubercular) gland in the neck. The tubercular matter softens and is eventually eliminated at the expense indeed of the gland, which becomes atrophied, the ulcerated parts cicatrising, and the remaining set of glands continuing sound. The unfortunate thing in the case of the lungs is, that the series of changes, analogous to those that take place in the gland, goes on, as a rule, until so large a part of the lung-tissue is invaded and destroyed, or until the recuperative powers of the system are so wasted, as to entail the death of the patient. There is nothing malignant in tubercle, nothing that poisons the blood, nothing in itself that tends to a fatal termination, nor does it fail to work its way to an end. But the changes it undergoes so impair the *vis vitæ* as to lead to a fatal result,—and this commonly, or in many cases, before the lungs are so destroyed as to be themselves unfit for the maintenance of the respiration. And the like may so far be said even of cancer; and all the more readily because the disease seldom invades organs, the actions of which are directly essential to life—the heart, the lungs, or the brain. But in its progress it exhausts the *vis vitæ*. This gives way before the cancerous process has had time to work out all its local issues. And so of its congeners, malanosis, and others. In short, there are very few diseases that do not in fact tend of themselves to come to an end, and that a favourable end in as far as they are themselves concerned. The misfortune is, that in many cases the life-strings will not bear the strain put upon them, while the morbid actions are running their course. And so they snap asunder prematurely.

14. Still, the great fact is,—and, for the sake of the millions of mankind that stand outside the pale of our Art, well it is that it is so,—that there is an inherent tendency in diseases to terminate Spontaneously or of their own accord,—and favourably, or in the restoration of Health.

15. This great fact in pathology we may connect with another great fact in physiology. It is this:—That even in the state of health, all vital action is in its own nature of temporary duration only. Every exercise of vital power,—every vital action performed, leads to the exhaustion of vital power, and to the death, disintegration, removal, and to the renewal of the constituent molecules of the part or organ engaged. The several vital powers concerned in maintaining the life of the organism, or by the exercise of which it fulfils the ends for which it exists, are in action from moment to moment. They become exhausted in their play; and this entails, as I have said, the death, disintegration, and the removal of the molecules participating in them, and the replacement of these by new ones—alike in structure and constitution. Now, what holds of the normal actions of the organism holds also to the morbid,

or of those same vital powers when acting abnormally. These operate for a time and then cease—with resulting effects more or less abnormal, yet, as Sir John Forbes remarks, with effects essentially natural. And, amid the incessant "*turbillion vital*" of the organism, the temporary healthy is ever striving after the mastery over the temporary morbid,—ever striving to replace the ill-favoured molecules of disease with the well-favoured molecules of health,—the aberrant actions of disease with the normal actions of health.

16. Further, this temporary duration of morbid action we are able to connect with two other facts. The *first* is, that when the external or exciting cause of morbid action is removed, or has ceased to operate, the morbid action itself ceases or comes to a final end. *Causâ sublatâ tollitur effectus.* In other words, the organism freed of its incubus reverts to its natural mode of action; it is left free to do the proper work of health. The *second* fact is, that the inherent tendency of the organism, ever in active exercise, is, as I have once and again observed, to maintain and when out of fear to revert back to the normal manner of its working,—to the state of health. And a mighty power over disease this tendency is! (See Lecture XII. § 6).

17. These, I apprehend, are the foremost facts in the history of the workings of the, *Vis Medicatrix Naturæ*,—of the organism "qui se guerit lui-même,"—*first*, the temporary duration of all abnormal as of all normal actions; *secondly*, the cessation of morbid actions on the removal or the exhaustion of their exciting causes; and, *thirdly*, the inherent and ever active tendency of

the living organism to revert to and maintain its normal condition, that of Health.

18. (ii.) In connection with what has now been put fore you, the next great fact to which I would call your attention (and a corollary indeed it is from it) is, the spontaneous recovery of strength and vigour on the subsidence of the morbid actions. This general fact is of wide application, and it holds as well of parts or organs that have suffered as of the system generally. In pneumonia, a portion of lung may for a time have been rendered useless; in pleurisy with effusion, a whole lung may have been made inactive. But these cured, the lung is again restored to its normal condition and the normal exercise of its proper function. Still better is the fact exemplified in what we see after the subsidence of an attack of typhus fever. The exhaustion of the general strength may be extreme. The patient may be left "as weak as water." But day by day,—very gradually it may be—he regains strength,—more gradually indeed in proportion as he is striken in years. Eventually, he comes to be what he was before the attack,—*ad omnia vitæ munera aptissimus.* And this restoration is brought about simply through the restoration of the natural powers of digestion and assimilation, muscular exercise in the open air and gentle mental excitement.

19. I have not yet finished the important subject now in hand. I shall, however, reserve till tomorrow what I have to say further regarding it.

LECTURE NINETEENTH.

The Modes and the Processes of Healing and of Recovery as occurring Spontaneously in Disease, continued. (iii.) *Provisions for the removal of morbid products*, e.g., *of serum, lymph, pus; for the healing of solutions of continuity; for the casting off of dead parts and the repair of breaches left. This a large subject.* (iv.) *Provisions for the stanching of hæmorrhages.* (v.) *Provisions for the reunion of broken bones in the callus thrown out, and also for the repair of ruptured parts, or in dislocations, &c.* (vi.) *Muscular hypertrophy and glandular enlargement provisions for obviating the effects of certain permanent lesions.* (vii.) *The more important of the Regimens instinctively adopted by patients, may be reckoned among the Provisions of Nature for the Cure of Disease. Remarks on some evil influences attaching to our professional training in youth.*

1. In continuation of the subject of my last lecture, and as forming a part of the workings of the *Vis Medicatrix Naturæ*, I may next observe (iii.) That in certain diseases, inflammatory diseases especially, we have Provisions in the organism for the removal of morbid products, for the healing of morbid lesions, and for the complete or virtually complete restoration of parts or tissues to their natural condition.

2. Thus, for example, effused serum may be absorbed,

even pus may be absorbed; coagulable lymph and blood may be in great part absorbed, or lymph may be transformed into pus, or disposed of by the adhesive process. And while pus may be thus got rid of, it may also, when not absorbed, find exit from the system by making its way, by interstitial absorption towards the skin or other mucous surfaces having a natural outlet, and then by ulcerative absorption, or simply by mechanical pressure, break its way through and be discharged. Further, while in the system, at least when in the areolar tissue, or in the substance of organs, pus is prevented from diffusing itself at large, and thus poisoning the blood or the tissues, by means of a wall of circumvallation being set up, constituting a sac within which it is confined, and this too from the very outset of its formation, or *pari passu* with this. Marvellous is the prescience, marvellous are the ways of the *Vis Medicatrix!* Occasionally, indeed, Nature is at fault, as in cases of the diffuse suppurative inflammation. Further, positive breaches of surface, or loss of substance, as from ulceration or casual wounds, are healed spontaneously by the processes of granulation and cicatrisation. Even dead parts, soft or hard, or osseous are cast off by a process of ulceration in the living parts, with subsequent cicatrisation of the open surface left; and in the case of bone by the deposition of new osseous tissue; while, as the parts die, the minute bloodvessels are sealed up beforehand by lymph exuded, a thing moreover which happens as well in the process of ulceration as in that of sloughing. No doubt with all her prescience, Nature sometimes misses the mark, as, for example, when she lets an abscess open into such a cavity as the bag of the peritoneum or of the pleura—or an ulceration, curative otherwise, to eat its way into a large artery. Yet the mischances of her work are few in comparison with the happy results of her doings.

3. The several curative processes and provisions already adverted to (i, ii, iii) how manifold are they and how beneficent! And they are all of them Nature's own doing. How large a part they play in the natural cure of diseases and of injuries well deserves the consideration of those that unduly magnify their office, as also of those that cast contempt on our science of therapeutics. But for these provisions, both physicians and surgeons would often be sadly at a loss. Without them, operative surgery would avail but little,—and even medicine would be greatly hampered in its power for good.

4. (iv.) Further: We have provisions, and these of various sorts, for the spontaneous stanching of hæmorrhages. We have them in the syncope which follows the rapid and copious flow of blood, and by which its further flow is often abated or entirely checked; in the clotting of the fibrin, in the retraction and narrowing, and often the closing of the ends and walls of the wounded or ruptured arteries; while further, we have provisions for the healing of the ruptured vessels, and for the removal of the effused blood from the substance of organs, or from the shut cavities of the body. In this way a person smitten

of sanguineous apoplexy may completely recover, albeit it is but seldom that the recovery is complete. So also in the case of dropsical effusions into the common areolar tissue, or into the shut cavities of the body, we have in the process of absorption a provision for the spontaneous removal of the serum—so soon as the cause leading to its exudation has ceased to operate. On this happening, it is astonishing sometimes the rapidity with which the effused serum disappears. I remember once being much struck by this. It was a case of the most extreme general anasarca I ever witnessed accompanied by profound coma, consequent on scarlatina, and occurring rapidly in a young lad of 18 years of age. The coma at once subsided,—within ten minutes,—and the anasarca disappeared within 24 hours, without a single dose of medicine,—by simply taking the tension off the vascular system by means of general blood-letting, suggested by Majendie's physiological experiments. Here indeed there was an interposition of Art; yet it was of the simplest possible kind, enough and no more to let Nature have her way. The remedy may fairly be said to have been a strictly physiological one,—and the result such as a copious natural diarrhœa might have effected. But this by the way, and if you like, under protest on your part in behalf of Art.

5. (v). Then, again, in fractures of bones, we have the exudation of lymph speedily assuming the characters of Callus serving to unite the ends of the broken bone and consolidate the shaft; and in ruptures of ligaments, in dislocations of joints, as also in

the rupture of muscles and tendons, we have sundry provisions for the restoration of the torn parts. Nature indeed, it must be allowed, has no power to set a broken bone, or to reduce a dislocation. Yet, as the surgeon knows, the compensations she is capable of making in default of that power are often wonderful. She can often make a crooked bone and a shortened limb effective enough for practical purposes; and she can provide a new joint which shall answer its purpose fairly well. There is even provision made for the spontaneous cure of an intussusceptio of the intestines in the processes of adhesion, ulceration, sloughing, and cicatrisation. And in cases of obstructed or obliterated bloodvessels, Nature avails herself of adjacent and anastomising vessels, which she enlarges, wherewith to obviate the death or the atrophy of parts, and maintain the circulation of blood through them in the parts beyond.

6. (vi). Further:—In muscular Hypertrophy and glandular enlargement, we have provisions for obviating the effects of certain permanent lesions,—particularly in the case of the heart; and in the case of double organs,—such as the kidneys,—perhaps also the testes, —perhaps too the ovaries,—and certainly the mammæ, in the preter-natural yet very natural development of the sound organ and increased activity in its action,—provision for compensating for the lesion and inaction of its fellow. Nay, even in the Atrophy of parts, effected by interstitial absorption, we have a provision for the removal or virtual removal of now useless organic tissue.

For Nature ever provident of her capital, will not waste her substance on her unprofitable servants.

7. What has been set forth in this and my previous lecture is an Outline of what seem to me to be the main provisions in the living organism for the Spontaneous Cure of Diseases. How varied they are in their kind, how ample, and how far reaching in their results! This may well excite in us feelings of admiration and gratitude! The first named—that of the temporary duration and the spontaneous favourable decline of the greater number of diseases is, indeed, the greatest and most important of them all. But they are all of them in their degree important and beneficent.—Without them—destitute of them, what a widely different thing would disease be for mankind from what it is! How sad it were to think of the unspeakably direr results that would accrue to our race and would in times past have accrued to it, had "our natures not been our physicians." Sad it would be, had things been so ordered from the beginning as that diseases once set on foot and fairly established, were permanent instead of temporary things; had they carried with them no remedy inherent in the organism itself, but entailed inevitably more or less of suffering,—more or less of disability, and no other issue than abiding distress, or chronic ill-health, or death. Well it is that things are as they are in respect of Disease and in the provisions made for its Spontaneous Cure!

8. (vii.) But there is yet another, of a subordinate

kind indeed, to be added to Nature's list. It is the more important of the *Regimens* (as we call them) *instinctively* adopted by invalids, and the adoption of which serves to help Nature in her curative work. One is, the *Antiphlogistic*; another, the *Tonic*. One ill of a fever or a severe inflammation naturally betakes himself to bed,—to rest,—quietude, low diet, &c. On recovering—now a hungry man—he seeks a nourishing diet,—and if in his power change of air and scene.—Nature will have her way every way she can. She turns to account even the instincts of humanity, in the working out of her cure of the diseases to which we are liable.

9. A word or two more in concluding this great subject. I would fain take occasion here to draw your attention to some circumstances connected with our professional training which seem to me to have more or less of an injurious influence on our minds. Our great work in life is to *save* Life, and to make life one of *Ease*. And yet, I fear, we are often led to have more regard to death than to life,—to Pathology rather than to Hygiene; and as regards Pathology to morbid anatomy rather than to the morbid actions which are the basis of it, which really constitute its proper subject and give practical value to it. The cry in some of our schools is for a Chair of Morbid Anatomy (or, as by a misnomer it is sometimes called Pathological Anatomy) rather than for one of Pathology,—which is the science of the ailments we suffer from when living, rather than the lesions that kill us, and which, when they

do so, go to fill our "pathological" museums. As well may (healthy) anatomy be regarded as a department of Physiology. Rather, in my opinion, continue to teach morbid anatomy in connection with Practice of Medicine, as at present in most schools. Are not the burdens on students in respect of Classes already heavy enough? As regards the greatest medical school in the kingdom—that of the University of Edinburgh, the subjects examined in, and which *dominate* the students' work, are now double, or more than double, what they were fifty years ago; while (the capacity of the human mind remaining the same) every one of the subjects examined in has attained to unmanageable dimensions. And following *suite*, the like has come to be the case in other schools and with other examining boards. Let the working of this duplex extension be judged of (so far) by one of its ostensible fruits,—the frightfully increased and increasing number of rejections at every board. If an additional Chair be justifiable, greatly more needed, in my opinion, in a National point of view, is one of Hygiene, to teach us as a profession how to advise the nation and the government to provide for the *prevention* of disease. This, I cannot but think, will ere long come to be an all-absorbing subject with the profession and the nation. But without dwelling on this, let us now consider for a little how we stand in some respects as regards the professional training we receive at the schools.

10. The Dissecting-room, one of the first of the class-rooms into which we come, and in which we dwell long, and the Dead-room of the Hospital into

which we come a little later on, have both of them in a way, I cannot but think, a misleading influence on many of us by diverting our minds from the strictly vital, dynamic, and mental, and disposing us to look at the being, Man, from the side of the organic and the physical or material. In our earliest years as medical students, we are most familiar with that being as we see his remains laid out before us,—dead, inanimate, the subject of our knives and our microscopes. Again: as we have that being *living*, yet lying ill in Hospital, we are for the most part first introduced to him in the Surgical wards. There, indeed, much that I have adverted to in this and my former lecture may be seen exemplified in vital processes of the most interesting kind; but there, too, there is so much of mechanism and of surgical procedure as to lead us to form a higher estimate of the surgeon's skill than of Nature's work. Again: In most schools the Materia Medica comes in early, and as well by its own presentation of itself in the shape of very material things (and these a very mountain of things), as by the way in which it is presented to us, with no reference, I make bold to say, to the *Vis Medicatrix* in any way, we have at this early stage (when mere babes at the breast sucking in our professional religion) withheld from us all consideration of there being a Materia Medica and a therapeutic Laboratory within the organism itself, and led to look upon Diseases (as far as we then know anything about them, which is next to nothing) as positive Entities to be positively cured by Drugs. Again: At a later stage, the most important of all, yet that to which the least amount of time is given, or can be given by most students, namely, when we enter the Medical wards in order to the study of Medicine proper, it is perhaps the Dead-room and its revelations that most engage our attention, or attract us most. It is the products of disease which we can see and handle, rather than the morbid actions that have furnished them, that take chief hold of our minds. We come—many of us do—to take a deeper interest in what brings the patient there than to the diseased actions or to the morbid processes going on in the ward during life, and which the physician is striving to counteract.

11. As to this, allow me in conclusion to put before you some pregnant utterances of Dr. Alison on the study of morbid anatomy. The quotation is one of the many gems to be found in the now nearly forgotten writings of that eminent physician and teacher. It has been quoted by others; and it cannot be too often brought into view. Here it is:—

12. "It is an important practical error to fix the attention, particularly of students of the profession, too much on those characters of disease which are drawn from changes of structure *already effected*, and to trust too exclusively to these as the diagnostics of different diseases; because in many instances these characters are not clearly perceptible until the latest and least remediable stages of diseases; the very object of the most important practice in many cases is to *prevent* the occurrence of the changes on what they depend; and after they are established, the cases are often hopeless, or admit only of palliative treatment. In

those diseases in which most can be done by Art, our practice must always be guided in part by conjecture, because, if we wait for certainty, we very often wait until the time for successful practice is past. Although, therefore, an accurate knowledge of the whole history of each disease is essential to its proper treatment, yet in a practical view the most important part of its history is the assemblage of symptoms, by which its *nature* at least, if not its precise *seat* may be known, *before* any decided lesion of structure has occurred. Accordingly, when this department of pathology is too exclusively cultivated, the attention of students is often found to be fixed on the lesions to be expected after death, much more than on the power and application of remedies, either to control the diseased actions, or relieve the symptoms during life."—(*History of Medicine during the present Century*,—Cyclopœdia of Practical Medicine, vol. I., pp. lxxxvii-viii).

13. With these golden words ringing in my ears, and I hope in yours also, I conclude what I have to say on this, in my opinion, all important subject. To unfold it fully, it would be requisite to take up each kind or form of diseased action, and each individual kind of disease, and consider in detail the several modes in which, independently of Art, it is brought to a final and a favourable issue. But to do this would be foreign to the object I have in view, which is exclusively the exposition of the general principles underlying my great theme.

LECTURE TWENTIETH.

The Modes and the Processes of Dying as resulting naturally from Disease. Two primary ways of Dying; (I.) CARDIAC DEATH. (II.) PULMONIC DEATH. *Two primary Modes of each of these:* (i) **Asthenia** *and* (ii) **Syncope** *the two Modes of Cardiac Death;* (i) **Apnœa** *and* (ii) **Coma** *the two Modes of Pulmonic Death.*

1. In unfolding this important subject, I may set out by observing that different authors vary somewhat in the view they take of the *primary* Modes of Dying. Still more do they differ in their view of the secondary or subordinate. The Modes, however, may all of them be reduced to *two* primary ones. In one sense indeed, there may be said to be but one: in other words, all the modes of dying may be resolved into one,—that, namely, from failure of the action of the Heart. The function of Circulation, although *subservient* to all the other functions of the living body, is that on which all these others are themselves immediately *dependent.* Hence it has been called the *fundamental* function of the living body. And when in general terms we speak of the Circulation, it is the Heart that we have immediately in view. It is this organ that maintains the movement of the blood in all parts of the body. There are, however, there is reason to believe, forces in operation in the region of the capillary blood-vessels (not

indeed in these vessels themselves, but in the parts they minister to)—forces arising out of the molecular changes going on there between these parts and the blood, that are *auxiliary* in some way to the action of the heart, nay, more, that are with the heart even *essential* to the maintenance of the general circulation. And indeed one of the recognised primary modes of Dying, that by Apnœa, furnishes unequivocal proof of that assumption.

2. Nevertheless, the Heart is the main organ of the Circulation; and holding the place it does in relation to all the other organs of the body, it may with truth be affirmed that so long as the Heart is in action, or is possessed of the power of acting, so long Life subsists. All the modes of dying, therefore, may ultimately be resolved into a permanent arrest of the action of that organ. Bear this steadily in mind.

3. Still, unquestionably, there are two ways that may well be called *primary* in which death may be brought about. Of these two, one consists in a direct failure or suspension of the action of the Heart; the other, in a direct failure of the action of the Lungs,—the functions of other organs not being in the first instance implicated. By failure of the action of the Lungs we mean, specifically, arrest of the arterialisation of the blood in the pulmonic capillaries. This arrest brings the circulation through the lungs to a standstill. The blood stagnates there; and this stagnation blocks the action of the Heart. While, then, the several ways of Dying are all of them eventually referable to a permanent cessation of the Heart's action, they may in a practical

sense (nor less truly in a physiological sense) be resolved into the two ways just indicated. This accords with Dr. Alison's *primary* distinction of them; and Dr. Alison is still entitled to be regarded as an authority on this subject. The fatal effects of injuries and diseases (he observes) "are always produced, either by their directly depressing or suspending the vital action of the organs of *Circulation*, or else by their obstructing the arterialisation of the blood, and, therefore, according to principles known in physiology, arresting the circulation at the *Lungs*." (*Outlines of Pathology*, p. 3). In the language of Bichat, the former is spoken of as Death *beginning* at the Heart; the latter, as Death *beginning* at the Lungs.

4. This twofold distinction, let me observe, is one expressive of a matter of fact. It involves no theory; and it is irrespective of the endless variety in the ways whereby death may be brought about. It is a plain matter of fact that, in all cases, Death results either from the Heart directly ceasing to beat, or from the Lungs ceasing to arterialise the blood. The Circulation is brought to a standstill either at the Heart, or in the Lungs. And avoiding meanwhile, for reasons that will hereafter appear, the terms—Syncope and Apnœa, the one may well be designated CARDIAC DEATH; the other, PULMONIC DEATH.

5. It may next be observed, and it is important to observe that *cardiac* Death may take place in two widely different ways. It may occur either *suddenly* or very rapidly, or more or less *gradually*, sometimes very gra-

dually. The circumstances, and still more the attendant phenomena, differ essentially as it takes place gradually or suddenly. It is when occurring suddenly or very rapidly that the term *Syncope* is properly applicable. Familiarly we associate this word with swooning away, or fainting. When occurring gradually or more or less slowly, the term *Asthenia* best expresses the mode; and it has come I think into general use among us to indicate that mode of dying, be the occasion of it what it may. What makes it of real importance that we should discriminate between those two terms, and have each of them to stand for a notable difference between the two varieties of failure of the heart's action is, that in the one (Syncope) we have sudden loss of consciousness; whereas in the other (Asthenia) we have perfect endurance of the consciousness up even to the moment when the last breath is drawn. Every way, practically as well as scientifically, this is surely an important distinction. The term Syncope indeed has been used *generically* to express *all* the modes of dying from direct failure of the Heart. But this use of it is somewhat confusing, especially to students. When one has died of phthisis after many months of slowly failing strength, dying inch by inch as it were, we do not say that he died in the way of Syncope, or that he *fainted* away. And yet Syncope is the technical expression of that mode of dying. The appropriation, however, of the one term (Syncope) to *sudden* failure of the Heart's action, and of the other (Asthenia) to *gradual* failure of it, would serve to give precision to our language, and at all times to convey a clear and definite meaning. And in these lectures, I shall invariably adhere to the distinction now pointed out.

6. Moreover, apart altogether from what obtains in respect of the consciousness, there is this marked difference between Syncope and Asthenia, namely, that in many or most cases of Syncope, the Heart is found to be still excitable by stimuli for a brief space after death or apparent death; while in most if not in all cases of Asthenia, the contractility of that organ is found to be quite extinct. This distinction is, I believe, a real one, although we are as yet in want of precise information in regard to it.

7. So also as regards *pulmonic* Death. Here there are two well marked distinctions that require to be clearly recognised, for they involve differences of a fundamental kind. Itself due to the non-aeration of the blood in the lungs and the consequent stagnation of that fluid in them, with arrest of its movement through them, *pulmonic death* may be produced in two entirely different ways:—

8. First, *directly*, or by the immediate shutting off of access of air to the Lungs, as in cases of drowning, suffocation, &c.; or secondly, *indirectly*, as by causes operating on the Brain, or on any part of what may be called the respiratory nervous system, and in such manner as to suspend the action of the respiratory nerves and muscles, and thereby prevent the entrance of air into the lungs. In the greater number at least, if not in all cases in which the nervous system is thus concerned, *Coma* (or loss of consciousness) is an accom-

paniment, if it be not an essential element in the arrest of the respiratory movements. Whether it be so we shall consider hereafter. Meanwhile, I remark that, as occurring in the former of the modes indicated, Pulmonic Death is spoken of as death by *Apnœa*, (or *Asphyxia)*; and that as occurring in the latter, it is spoken of as death by *Coma*. Bichat spoke of the one as death *beginning* in the Lungs; of the other, as death *beginning* in the Brain.

9. In all the cases to which the term death by Coma applies, the arrest of the aeration of the blood is due (as has just been said) to the arrest of the movements of the respiratory muscles. It is by these movements that the external air is taken into the lungs; and it is by the suspension of them that its admission is excluded. But whether in all these cases, the state or condition of Coma furnishes a sufficient explanation of the arrest of these movements, is questioned by many, particularly now-a-days by most physiologists. The question involves the whole question of Reflex Action, as distinguished from actions dependent on Sensations *consciously* felt. The Reflex action theory, while not denying the fact of Coma as obtaining in the cases coming under this general head, would resolve the operation of all the causes acting on the nervous system, and through it suspending the respiratory movements into an arrest of that kind of action, namely, Reflex action. Admitting this, yet as we have no short term for expressing arrest of reflex action, that of death by Coma may with that understanding still continue to be retained, as no doubt it will.

10. It is further important to observe, that as death by failure of the Heart's action (Cardiac Death) may be suddenly or gradually induced, leading to notable variations in the attendant symptoms, so death from failure of the action of the Lungs (Pulmonic Death), whether occurring in the way of Apnœa or that of Coma, may be suddenly or very gradually effected, leading also to marked differences in the phenomena that attend and characterise the dying process.

11. So much for the general principles involved in the subject before us. Here and there I have had occasion to advert incidentally to so much of the physiology of it. This, however, will have to be considered in detail in a future lecture. Meanwhile, let me just take note of one mode of dying not yet brought into view—albeit, if real, a mere variety of Syncope. It is that from actual *spasm* of the Heart,—the general circulation being arrested, not from the heart losing its contractile power, but from its action being unduly energetic and prolonged, death occurring before the spasm has had time to relax itself. It is in this way, for example, that Digitalis is said by some to prove fatal when exhibited in excessive doses. Whether this be so, we shall inquire hereafter. But apart from this, it is a *conceivable* variety of Syncope; and there is a popular notion that death may occur suddenly in that way, or from *spasm* of the heart, as *e.g.*, in Angina Pectoris.

12. Let me now advert to one or two points con-

nected with the subject as a whole, and this with the view of clearing up sundry ambiguities. The old division of the Modes of Dying into Syncope, Asphyxia (Apnœa) and Coma needs a passing notice. Exceptions that have been taken to Bichat's phraseology as to Death *beginning* here or there, may be briefly referred to; as may also the raising of certain mere varieties of the dying process into the rank of *typical* modes.

13. *(a)*. The old threefold division of the modes of dying is faulty on two grounds,—*first*, because of an undue extension being given to the word Syncope; and, *secondly*, because of its placing the death by Coma on a level with that by Asphyxia, whereas it is merely a submode of Asphyxia. The old distinction, moreover, suggests the idea of there being three *primary* modes of Dying, while there are in reality only *two*.

(b). As to the word "*beginning*" made use of by Bichat. As regards the death by Coma, spoken of by him as beginning at the Brain, the expression has been objected to on the ground that equally with Apnœa, it is due to arrest of the circulation through the Lungs and consequent stagnation of the blood there; and that it may equally with Apnœa be said to have its beginning at the Lungs. But it is also true that in the death by Coma, it is the state of the Brain which that word symbolises that directly leads to what causes the arrest and stagnation in question, warrant enough, surely, for saying that this has its beginning in the brain. Further, in a practical point of view, it is the brain we have to look to in these cases: it is the Coma we have to meet and obviate. Again:—Sir Thomas Watson re-

marks that the word beginning is open to challenge in respect of another mode of dying, namely, that by Syncope, strictly so called. This mode of death we speak of as beginning at the Heart. Yet in very many cases, as in that from violent concussion, it may most truly be said to have its beginning in the brain. The word "*beginning*," indeed, has no technical significancy; yet once clearly explained, it need never mislead us; while it is in a manner indelibly associated with Bichat's name and work.

(c). Again:—Some pathologists include among the primary modes of dying certain forms of it which are not really *typical*. Thus Dr. J. B. C. Williams regards death by *Anæmia* or loss of blood as a *primary* mode. In reality, it is only a variety of Syncope or Asthenia, according as the loss of blood is sudden or gradual, is attended or unattended by loss of consciousness.* Further:—Professor Aitken seems to consider death by *Starvation* as entitled to special consideration as something more or other than a mere variety or form of

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* Again:—In speaking of the modes in which Aconite may prove fatal, Dr. Fleming mentions three,—one is, "a powerfully sedative impression upon the nervous system." Another is Syncope; the third is Apnœa (paralysis of the muscles of respiration). But, pray, what, apart from Syncope, is the first-named? It is one unknown to Bichat. A powerfully sedative impression on the nervous system (concussion) causes death by Syncope, not in itself or by itself. If we could only tide a patient over concussion of the brain by maintaining the action of the Heart till the concussion had subsided, as we can a patient over Coma by maintaining the breathing artificially, all would in the end be well. In short concussion is not *per se* a recognised mode of death,—or one aside from Syncope.

Asthenia. For this there seems to me to be no warrant. It is surely a mistake to complicate an important subject by raising subordinate varieties to the rank of primary modes.

14. On a subject so important as this, it seems to me highly desirable that we should avoid all ambiguity of language, and so express ourselves in regard to it as to be on all occasions intelligible. Nor, in my opinion, need there be any difficulty in doing so. It is important, I think, that we should in the first instance adhere steadfastly to the two primary ways of Dying already indicated, namely, that from direct failure or suspension of the action of the Heart, and that from direct failure or suspension of the action of the Lungs; and designating the one CARDIAC DEATH, the other PULMONIC DEATH, do away with the old threefold distinction of death by Syncope, death by Apnœa, and death by Coma, that is, do away with it as a *primary* arrangement. This understood, and expressed as above, we should then make two primary divisions of each of these; to wit, of Cardiac Death into Death by *Asthenia* and Death by *Syncope;* and of Pulmonic Death into Death by *Apnœa* and Death by *Coma*. These *four* would embrace every conceivable Mode, manner, or form of the Dying process; while the names given to them would obviate all misconception in regard to them. This classification, embracing no innovation on views already received, but only making them somewhat *formal* or articulate, would, I am satisfied, be at once scientifically accurate and practically useful.

15. Presenting the foregoing in a somewhat tabular form, the table would stand thus:—

TWO PRIMARY WAYS OF DYING:

I. CARDIAC DEATH. II. PULMONIC DEATH.

CARDIAC DEATH.

TWO PRIMARY MODES OF IT:

1. *Death by* ASTHENIA.
2. *Death by* SYNCOPE.

PULMONIC DEATH.

TWO PRIMARY MODES OF IT:

1. *Death by* APNŒA.
2. *Death by* COMA.

LECTURE TWENTY-FIRST.

Of the Phenomena and Characteristics of the several Modes of Dying. (CARDIAC DEATH). I. *Of Death by* **Asthenia**; II. *Of Death by* **Syncope.** (PULMONIC DEATH). I. *Of Death by* **Apnœa**; II. *Of Death by* **Coma.**

1. We have now to consider the phenomena or characteristics of the several ways and modes of Dying, reserving meanwhile the physiology of the dying processes.

2. Before doing so, however, let me again call your attention to the Table of the Modes of Dying which I shewed you at the end of yesterday's lecture (page 228), and urge on you the importance of holding fast by it.

3. *First,* of CARDIAC DEATH (or Death beginning at the Heart.) Of this, as we have seen, there are two primary Modes. The fundamental distinction between them lies in this, that in the one the action of the Heart fails more or less gradually, while the conciousness remains intact; and that in the other, the action of the Heart fails suddenly or rapidly, the consciousness failing simultaneously. Each of these modes we shall have to consider separately. But, it may be observed, there are certain features common to both. Both modes are conspicuously characterised by feebleness of pulse, and paleness and coldness of the surface,

attended often with cold clammy sweats and muscular debility.

4. (I). Of death by Asthenia. This, although not the more striking of the two modes of cardiac death, is the simpler, and it is the more frequent. It may well therefore engage our attention first. When the failure of the Heart's action takes place *slowly*, the impetus of the blood on the Brain is very gradually diminished, and accordingly this organ suffers very little, or in no appreciable degree.—So little indeed does the brain suffer, that the pulse may become quite imperceptible at the wrist, and the skin of the extremities icy cold, and the breath expired almost equally cold, and yet death ensue without the mind or the senses being at all impaired. Occasionally indeed the senses of sight and hearing are somewhat blunted, yet not until near the end. But the mind—the intellect is clear, the voluntary movements of the muscles, although they may be enfeebled, are commonly performed with perfect precision; and the sensation which prompts to the acts of inspiration is entire. Sometimes indeed the breathing is somewhat heaving or laboured. But this is not because of there being any impediment to the access of air to the lungs, but because of the increasing difficulty with which the *enfeebled* heart propels the blood through them, and to the sensation in question (the *besoin de réspirer*) being entire, and in some degree uncomfortably felt, a circumstance which instinctively heightens the efforts made to appease it. It may be added that in this mode of dying, the pulsations of the heart usually, or often become more frequent as they

become feebler, the heart becoming more irritable as it becomes weaker. But the specially striking feature in many cases of this Mode of Dying is the *protraction* of it. The patient yields up his life slowly, even when the dying process is actually begun. Even when the relatives are assembled by the death-bed, it is astonishing often the length of time that elapses before the thread of life is snapt asunder. At length the pulse ceases to be felt at the wrist, after being for hours scarcely perceptible there. The coldness of the surface creeps very slowly from the feet and hands to the knees and elbows. To the by-standers death seems from moment to moment to be immediately impending. And yet, as is well known, even then hours often pass away before the fatal event takes place.

5. This mode of dying, exceedingly well marked in many cases, is particularly well exemplified in cases of continuously recurrent hæmorrhage, in sundry forms of injury, as after capital operations or scalding, in many cases of chronic wasting disease,—phthisis, carcinoma, and exceedingly well in peritonitis. It is so also in many cases of poisoning. Socrates, it would appear, died in the way of Asthenia. After he had quaffed unmoved the deadly Hemlock draught, he still held on to think and to speak to those around him. Even after his limbs were palsied and cold he continued to do so.

"O'erpowered at length, dim grow his eyes,
His breath departs, a corpse he lies."

This tallies exactly with a case recorded in the old *Edinburgh Medical and Surgical Journal*, by Dr. Hughes

Bennett of a man who died in three hours and a quarter after eating, by mistake for parsley, a quantity of Hemlock leaves. Paralysed in all the limbs, first the lower, then the upper, he yet (virtually) retained his consciousness to the last.

6. (II). Next, of death by SYNCOPE. When from any cause the action of the Heart fails suddenly or very rapidly, as from the bursting of an aneurism, or a violent blow on the head, or an over-powering mental emotion, the phenomena are widely different from those met with in the former Mode. In bygone days medical students were familiar with them as the result of a full blood-letting *(ad deliquium)* from the arm in the erect posture. In such cases, the action of the heart rapidly failing, there is a sudden diminution of the pressure on the brain; and the functions of this organ are at once suspended. There is commonly, first of all vertigo, tinnitus aurium, confusion of thought; and then often, even sometimes without that premonition, an instantaneous loss of sense, thought, and voluntary motion,—the person so affected, if standing, falling at once to the ground. Here we have what is called a complete fit of syncope, a sudden fit of fainting, or a fainting fit. The pulse may be still quite perceptible, although feeble, and the skin simply cool, but not remarkably cold. In such cases, the abolition of the general sensibility, and with it of the *besoin de respirer*, is often so great that the respiratory movements may be nearly or entirely suspended without any ill consequences accruing from the suspension of the respiratory process. There is often some degree of vomiting;

sometimes there are spasms of the voluntary muscles, occasionally severe, amounting to convulsions. Often there is voiding of the contents of the bowels or bladder or both. In some cases, the pulsations of the heart, especially in patients of a robust habit, are slow as well as feeble, and indeed they commonly are such, contrasting with the rapidity of the pulsations in many cases of Asthenia (see Alison's *Path. and Pr.* pp. 534, 535).

7. At present we are concerned only with the general and more essential phenomena that characterise the several modes of dying, and we defer to a later period all discussion as to the physiology of the two varieties of failure of the Heart's action now in view. You cannot fail, however, to perceive how great is the contrast between the two; and I should wish you to have at your finger ends the characteristic phenomena of each. I will only add, as I remarked in my former lecture, that I think it were well if we rigidly adhered to terms sufficiently distinctive of each,—if on all occasions we restricted the term Syncope to *sudden* failure of the heart's action with *loss* of consciousness, and the term Asthenia to more *gradual* failure of its action with *endurance* or retention of the consciousness.

8. *Secondly*, of PULMONIC DEATH (or Death beginning at the Lungs). Of this way of dying we have also two *primary* Modes—Death by Apnœa, and Death by Coma.—Both are due to suspension of the respiratory process and consequent stagnation of the blood in the Lungs, but the suspension in the former is direct, in the latter

indirect. Let us now consider the phenomena by which they are respectively characterized.

9. (I). Of death by Apnœa. In this Mode, while the access of air to the Lungs is directly prevented, the action of the Heart and that of the Brain (the consciousness) are in the first instance, or at the outset, entire. The ways in which that access may be shut off are manifold, as by suffocation, strangulation, drowning, immersion in a gas devoid of oxygen but not in itself poisonous, &c., &c. The phenomena vary more or less according to the way. Thus in drowning, they vary in some respects from those attendant on smothering. What, however, it above all concerns us to know is, that the phenomena vary to the greatest extent according as the occlusion of air is *complete* or *incomplete* from the beginning; and when *incomplete* according to the degree in which this obtains. For, as to this there may be an almost endless variety of circumstances with corresponding modifications in the attendant symptoms. The occlusion of air may be at once thoroughly complete, causing death in a minute or two; or it may at first be incomplete, gradually increasing however in completeness, yet so as not to entail a fatal issue for many minutes, or even for some hours, or it may be several days. Bear steadily in mind this difference as to *time.*

10. The phenomena will be best exhibited by taking a case in which the occlusion is *absolutely complete* from the first, and in which also the operating cause is of the nature of smothering,—the consciousness being entire, and the limbs and the body generally free to act.

11. In such a case the phenomena, Dr. Alison observes, may be divided into three stages. (1). The first is characterised by the intensity of the sensation which in the natural state prompts to the acts of inspiration; and, consequently, by violent and laborious, although ineffectual attempts to appease that sensation by the action of all the muscles of inspiration, and in some instances by other actions, voluntary or instinctive, but still under the guidance of conscious sensibility. Lividity of the surface takes place even before the end of this stage. How agonising that sensation of want of breath is, and must be,—how frantic the efforts to appease it, one can understand! Not a few that have experienced the agony, as those rescued from drowning, have been able to tell that the reality cannot be expressed in words. (2). The next stage is distinguished by insensibility (unconsciousness) rapidly increasing, and attended with irregular spasms or actual convulsions. (3). And the last stage of all is indicated by the cessation of all effort, and of all *outward* signs of life,—while the heart's action is known still to go on for a very brief space of time.

12. In the case of a warm-blooded animal in the full possession of its vital powers, exposed suddenly to complete arrest of access of air to the lungs, it may be stated, Dr. Alison further observes, that the first two of these stages are very generally over within three minutes, seldom extending to five; and that the action of the heart very generally ceases within less than ten minutes from the beginning of the obstruction. From the investigations made several years ago by a Com-

mittee of the Medical and Chirurgical Society of London, it would appear that the *average* duration of the respiratory movements is 4 minutes, 5 seconds,—the extremes being 3 m., 20 s., and 4 m. 40 s.; and that the average duration of the heart's action is, 7 m., 11 s.,—the extremes being 6 m., 40 s., and 7 m., 45 s.; and accordingly, that on an average, the heart's action continues for 3 m., 6 s. after the cessation of the respiratory movements. These data (thoroughly reliable) give even shorter periods than those stated by Dr. Alison. In the case of drowning, not now in our view, the periods are even shorter, at least the period within which recovery is possible.

13. I have said that in cases in which the occlusion of air is not at once complete, the phenomena differ more or less widely; and they obviously do so according to the degree of incompleteness. In disease, it is seldom or never so complete as in the picture now drawn. Nevertheless, as Dr. Alison remarks, even in disease all the three stages may often be observed, although in a gradual and somewhat irregular manner, the dyspnœa and lividity being succeeded by delirum, often by spasm, and ultimately by coma; and the respiration coming to a stand-still sometime before the cessation of the action of the heart.

14. Dr. Latham has given us a graphic picture of death by Apnœa, occurring as the result of disease. Nothing could well be more true to nature, or more happily depicted than the account of it he has given us. I might refer you to it as it stands in his published Clinical Lectures. But these may not be in your hands,

or within your reach; and it is one of those touches of his that deserve being reproduced.

15. "As I was going round the hospital (St. Bartholomew's) one morning, a dying woman was carried in and laid upon a bed. What a frightful picture she was! Cold, and livid, and pulseless; her eyes starting from their sockets; her mouth wide open, and lips, and tongue, and teeth, black with sordes; and breathing convulsively, and with a kind of scream.—With what agony she struggled for life! and what force she used to preserve it! Tossing about her arms, striking aside all who came near, for they kept the air from her; and dashing away a cup of water that was offered, for she knew a single drop would suffocate her."

16. From this description you may well imagine this poor women's condition and her agony. You may have a still clearer idea of the whole affair, and realise more vividly than you otherwise might, the signal triumph of Art, if I put before you what Dr. Latham says further of the case. "What was to be done?" he asks. "I ordered her trachea to be opened. Mr. Earle was at hand, and did the operation at once. The relief was complete, and she sank into a calm slumber."—What a contrast! She soon got well. "I have twice, at distant intervals (says Dr. Latham) met her in the street, and she has recognised me with a smile."[*] Well she might; and with a courtesy too, to her deliverer!

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[*] *Lectures on Subjects connected with Clinical Medicine.*—Lec. iv., pp. 93-94 (1836).

17. (II. Of death by Coma.—This mode of dying is also due, yet remotely or indirectly to the access of air to the Lungs being prevented. But instead of the consciousness being entire as in the former mode, it is from the outset blunted or abolished; and, in consequence of this, the respiration fails because the nervous agency by which, in the natural state, the respiratory movements are effected, ceases to operate.

18. In *Apnœa*, the consciousness is in the first instance or at the outset entire; and the more obvious outward phenomena attach to this circumstance. The *besoin de respirer* is felt, and comes quickly to be agonisingly felt, and unavailing struggles ensue to appease it. In the case now before us, however, this want of breath is not felt, or in as far as it is so, it is unattended with any distress. This makes a wide difference between the two cases, between death by Apnœa and death by Coma.

19. Moreover, as regards the latter it is easy to understand that the extent to which the general sensibility fails, and the rapidity with which it fails, will vary greatly in different cases; and that differences in these respects will materially modify the attendant phenomena. The conscious sensibility may fail suddenly and completely, as in certain cases of apoplexy,—or very quickly and completely, although not suddenly as in certain cases of poisoning, *e.g.*, with opium. In other cases, its failure may be very gradual, the blunting of the consciousness being slight at first, creeping on slowly—deepening by degrees. This is seen in many cases of bronchitis, especially capillary bronchitis,—in

pneumonia,—in general dropsy from heart disease,—and still better in certain cases of kidney disease.

20. There is perhaps greater variety in the phenomena of the dying process in this mode of dying than in those of any or almost any of the others, and this by reason of the endless variety in the degree of *completeness* or *incompleteness* of the failure of the sensibility, and the *rapidity* or the *slowness* with which it sets in and progresses. It is practically important to be alive to this in judging of individual cases; and in order to give a clear and useful account of the phenomena, it will be expedient to adduce two or three typical cases.

21. *(a)*. Let us first take a case of Apoplexy,—simple (congestive), or sanguineous, in which the Coma is complete or "profound" from the first, and has set in suddenly. The patient lies unconscious of all that is going on around him. He replies to no questions put to him. He is unmoved by any efforts made to rouse him; for, in fact, he neither feels nor hears. With variations in different cases, his breathing is peculiar. Naturally a reflex act, it is yet in the natural state a more or less strictly voluntary act, or a combination of the two. In the condition now in view, it comes to be wholly reflex; the *besoin de respirer* is unfelt; the voluntary agency is withdrawn, and this circumstance imparts a special character to the entire respiratory process. It goes on more or less as in sleep, with this difference,—that in sleep the voluntary agency, although its exercise is not afterwards remembered, is still more or less in exercise. The breathing is for the most part slow, sometimes interrupted, intermittent, irregular, ceasing often altogether

for a few seconds, and then going on again. During inspiration, there is often snoring or stertor; during expiration, a puffing or flapping (sometimes explosive) of the cheeks, both referable, as the physiologist knows, to continuance of the unconscious reflex, and the loss of the conscious voluntary power. Not unfrequently, the pulse is somewhat slow, laboured, unequal, intermitting, yet often full. The face is frequently turgid and livid, or presents a mixture of pallor and lividity. The limbs are motionless, the will to move them being wanting; for the most part they are flaccid, yet not seldom some of them are more or less rigid, with occasional spasms, or even convulsions. Often there is paralysis of the muscles of one side of the body, with the exception of the diaphragm and intercostals. Deglutition is possible only in as far as it is reflex, fluids simply put into the mouth running out at the angles,—being swallowed with ease only when put well back into the mouth. The bowels are usually torpid, and the fæces and urine if passed at all are voided involuntarily.

22. As the case advances, if going on to a fatal issue, the breathing gradually becomes more laboured, more interrupted, or intermittent, and also more feeble. The pulse also, as a rule, becomes feebler, and more irregular, yet not always notably or proportionably to the breathing. After a time, which varies greatly in different cases, from a few minutes to several hours, the breathing entirely ceases. Not infrequently, the action of the heart and the breathing cease simultaneously. Yet, not infrequently, the pulse may be distinctly felt at the wrist for some seconds after the last

breath is drawn. It is only, however, for a few seconds. The animal heat also may be entire to the last, a circumstance which contrasts remarkably with what obtains in Asthenia, in which the limbs may be icy cold for hours together before death. These two circumstances,—the maintenance of the animal heat, and the survival of the action of the heart,—the latter especially, till after the cessation of the breathing, are carefully to be borne in mind. They are in a manner characteristic of the death by Coma.

23. *(b)*. Let us next take a case in which *Opium* is the occasion of the Coma; and let it be a case in which the dose is excessive and is taken by one unaccustomed to the use of the drug. Such a dose,—say one of from two to three ounces of laudanum, very quickly takes full effect on the nervous system. If it produce any antecedent excitement of either the brain or the heart, the stimulation is of exceedingly short duration. It is in fact scarcely perceptible, and it must be very evanescent. The obvious, the only obvious effect is, a *narcotic* action on the brain,—and it may be more or less of a *sedative* action on the heart. As regards the nervous system, there is very quickly induced a blunting as to all external impressions, a torpor of all the capacities of the mind and of the will, gradually and steadily yet speedily passing on to a profound oblivion and stupor, with extreme contraction of the pupils of the eyes. In short, the whole nervous system, as related to the capacities of sensation, will, and motion, is quickly overborne, and the deepest coma obtains. Again, as regards the Circulation, the pulse, if for a few minutes

excited and made fuller, soon becomes softer, smaller, and feebler. The general surface becomes moist, the features pale, the limbs flaccid. Coldness beginning at the extremities, becomes general over the body, although there are exceptions as to this. The breathing at first slow, becomes laboured, and often, yet not always, sterterous or noisy, unequal, with intermissions, suspended, that is to say, for a few seconds, and then going on again, often with a puffing action of the cheeks. Gradually and steadily the intervals of suspended breathing lengthen, while the acts of inspiration get feebler. At length the breathing ceases: a final inspiration is drawn, and the muscles of the face and jaws set in a feeble spasm. The pulse, commonly feeble at this stage, is yet quite distinct: it may still be felt at the wrist, felt even after the last breath is drawn. But it is for a brief space only; for a few seconds, seldom exceeding sixty. In some cases, however, the cessation of the heart's action seems to be simultaneous with that of the breathing. It may be added that as a rule there is an entire absence of convulsions in persons thus poisoned—by opium.

24. *(c)*. Let us next look at the phenomena of death by Coma as we have them in a case of uræmic poisoning, the result of kidney disease. These are admirably depicted by Dr. Flint.—Premising that in this set of cases, Coma may precede or follow convulsions: that it may occur and prove fatal without convulsions; and that the coma may set in suddenly, Dr. Flint says of it: "Generally the coma is developed gradually, the patient being more or less somnolent, dull, or lethargic for

several days before coming profoundly comatose. The coma is sometimes quiet, and in some cases accompanied by stertor. Marked dilatation of the pupils is sometimes observed. The face is congested, sometimes becoming livid, and death is preceded by the tracheal râle." Yet sometimes there is pallor of the face all through. The breathing gradually fails, becoming intermittent or suspended at intervals until it ceases altogether, the heart's action continuing for a short time thereafter.

25. These are the essential features of death by uræmic poisoning.—Convulsions are a frequent accompaniment or precursor; but they are not of the essence of it. "They are epileptiform in character, and vary greatly in degree and extent in different cases. They occur in paroxysms, which may be repeated at short intervals, the patient, in the intervals, being completely comatose, the convulsions at length ceasing, and the coma continuing until death. This is the rule; but exceptionally the patient recovers intelligence, and hours, or days, weeks or months may elapse before a recurrence takes place." It may be added that *delirium* "is occasionally a prominent feature in cases of uræmic poisoning," as is also cephalalgia and vertigo. But neither these nor convulsions are of its essence. (Flint's *Principles and Practice of Medicine*, 3rd edition, pp. 766-7).

26. Such are the leading phenomena of the several Modes of the dying process,—of that by Asthenia,—that by Syncope,—that by Apnœa,—and that by Coma.

It is important that you should so study these phenomena as to be familiar with them, and be in a position to recognise and interpret them aright when they come before you in practice. Then will you be the better able to give effect to Dr. Cullen's "memorable" injunction "to obviate the tendency to death."

27. One word more. In not a few cases of disease, there is often a *combination* in the same case of one or more of the modes of dying now referred to. It is often difficult, in some cases it is virtually impossible to say, during life, in what way particularly death is threatening. It were to no purpose to go into details on this part of the subject. Let me just say this, that a clear understanding of the principles underlying the several primary modes of dying, and an intelligent familiarity with the phenomena by which each is characterised, will help you greatly in practically dealing with difficult cases as they come before you. It is obvious, however, to remark, that in those complex cases in which Death is at once laying on both his hands, our hope of successfully resisting him must be small indeed.

LECTURE TWENTY-SECOND.

Of the Physiology of the several modes of Dying.—(CARDIAC DEATH.) I. *Of that by* **Asthenia**; II. *Of that by* **Syncope.** *Question as to whether* **Syncope** *ever results from Spasm of the Heart.*

1. In connection with the several Modes of Dying, it only remains for us to consider the Physiology or the rationale of them. In doing so, I shall take them in the order in which they stand in my two previous lectures.

2. CARDIAC DEATH.—Of this way of Dying we have, as you know, two primary Modes—that by *Asthenia* and that by *Syncope*. The striking difference between these two modes in respect of the Consciousness I have already pointed out,—as also this other difference which holds very widely, namely, that in the one (Asthenia), the Heart after death is found to be unexcitable by stimuli; while in the other (Syncope) it is often excitable by stimuli.

3. (I.) Of Death by ASTHENIA. In this mode of dying, well exemplified in many ways, as by slow but frequently recurring hæmorrhage, peritonitis, phthisis, starvation, &c., the Consciousness remains clear, and the senses entire to the very last. The intellect is unclouded, the Voluntary power (the Will, which is the *Ego*) is exerted with precision over the train of thought

and over the muscles that are naturally obedient to it, and the breathing is essentially natural; while the action of the Heart gradually fails, and with it the animal heat,—the pulse becoming imperceptible at the wrist and the skin cold as ice, hours before death actually occurs by the final cessation of the heart's action.

4. The perfect endurance of the consciousness and of all that attaches to it in this mode of dying is sufficiently remarkable. Yet it is fully explained by the circumstance that while the arterialization of the blood is duly maintained and arterial blood continues to be transmitted to the brain and whole nervous system to the very end, there is no sudden or undue change in the movement of the blood through the parts in question. After a time the blood may come to be transmitted in a very small quantity through them; yet the change is so gradually effected, that the nervous system has time to adapt itself to it. We shall presently see how marked is the contrast in that respect between what holds in this mode of dying and what holds in the mode next to be considered,—that, namely, of sudden Syncope.

5. We have seen that in the mode now before us—that of Asthenia—the breathing virtually holds on as in the natural state; and that it *survives* the action of the heart. It goes on naturally, because as well the voluntary as the reflex power is unimpaired. It is true, indeed, that not unfrequently, after a time (although by no means always) the breathing comes gradually to be somewhat heaving and laborious,—as is seen sometimes in the later stages of phthisis. This, however, is

referable (as Dr. Alison observes) not to any impediment to the access of air to the lungs, for there is none, but simply to the increasing difficulty with which the *enfleebled* heart propels the blood through them. (Path. and Pr. p. 534.) In many such cases, you will see, if you watch them closely, that, for hours together, the breathing is in no degree heavy or laborious: it is merely feeble, short, or quick. The pulse may long have ceased to be perceptible at the wrist, and the arms and legs may long have been quite cold. The only sign of life may lie in the small, still, faint breathing. For, although the consciousness is entire there may be no manifestations of mental exercise, or only at long intervals,—in an opening of long shut eyelids, or perhaps a smile, or a feeble whisper. In many cases, it is to the breathing alone that the attendants look. In truth, in many cases, as I have myself often seen, there is nothing else to look to. For the pulse is gone; and at a time so solemn (for of all the modes of dying this is the most solemn—so still is it and often so protracted) it would be unseemly to put the stethoscope to the region of the heart. And it is the cessation of the breathing,—a gasp,—repeated once and again,—a sudden yet often a somewhat prolonged gasp, with a curl or a setting of the muscles of the face, that betokens the moment of dissolution. It is this that enables the medical man if present to say to the friends authoritatively,—"it is all over." And in connection with this point let me recal to your recollection the popular notion of applying a looking-glass over the mouth of the seemingly departed one,—to determine the absence or presence of the dew of the breath.—Shakspere notices this in *King Lear* (Act v. Scene iii) as when in reference to the death of Cordelia, Lear says:—

"I know when one is dead, and when one lives;
——— Lend me a looking-glass;
If that her breath will mist or stain the stone,
Why, then she lives."

6. I have said that in death by Asthenia, the breathing survives the circulation,—that is, it goes on after the heart has ceased to beat. It is otherwise, as we have seen, in death by Coma. The reason is that in Asthenia the breathing goes on until blood is no longer sent by the heart into the lungs to be acted on there. Possibly it may go on until the consciousness itself fails, until the *besion de respirer* is no longer felt and this by reason of the final cessation of the circulation, on which all vital action and with this the action of the brain and the whole nervous system is dependent.

7. As to the gradual, slow failure of the animal heat, this needs no explanation. Presumably the other organic processes go on correspondingly,—*e.g.*, the secretions of urine, bile, &c., *i.e.*, feebly and increasingly so. As to the Heart itself, its contractile power gradually fails,—how gradually in some cases, and with what reluctance one may say, is indeed astonishing. Apart from the causes outside itself entailing that slow failure, the gradual diminution of its own nutrient supply of blood arising from its own increasing weakness contributes thereto. And the final cessation of its action is due to the complete exhaustion of its

own inherent vital power—of contractility. After death, even the moment after this, its fibres are no longer excitable by stimuli directly applied to them.—Pray, bear this last statement in mind, for it has an important bearing, physiologically and curatively, on some varieties of the mode of dying next to be considered.

8. (II.) Of Death by SYNCOPE. There is rather more complexity in the physiology of this than of the preceding Mode, and there is some difficulty as to certain points. Let us consider what the facts are that need explanation and what explanation can be given of them.

9. Two things happen simultaneously or virtually so. One is a sudden and powerful impression on the Brain; the other a sudden and powerful impression on the Heart. At once, as the result of the impressions, Consciousness is abolished,—the Heart stops its beating,—and death ensues. What is the rationale of this? It is this:—that although the Heart is essentially independent of the Brain, at least as regards its inherent vital power, it is yet liable to be *influenced* by it and through it; and in this case it is *fatally* influenced by it. The impression made on the brain, or, as in certain cases, on the whole nervous system through the cœliac axis, reacts on the heart producing an impression there which if not exhaustive of its vital power of contractlity, at least suspends its action. Another thing also happens. Simultaneously with the loss of consciousness and cessation of the heart's action, the Breathing fails. The

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wholly in the Heart. And the injury done to this organ varies doubtless in its degree in different cases. In some, the impression made—the shock imparted—(*e. g.*, by Lightning) is such as at once and for ever to extinguish its vital power. In such cases restoration is impossible. In others, however, the impression made is short of this. The action of the heart fails, but its vital power is intact, or, rather it is not extinct. Restoration is still possible; and it may be brought about if the suitable remedy is seasonably administered. In certain cases, transfusion is the proper remedy. In cases of hæmorrhage, if warm blood is without delay transferred from the vein of a living man into the vein of one seemingly dead from loss of blood, resuscitation may quickly be brought about. In another case, the vapour of Ammonia applied to the nostrils, or, still better, often, flipping of the surface with a wet towel, or a flagellation may, through the nervous system (still susceptible of impressions), rouse the enfeebled and quiescent heart. Otherwise—this now still organ will remain still. In some cases, however, the heart may after a little while resume its action spontaneously.

11. In apparent death, therefore, by Syncope, it were an error to suppose, that equally with that by Asthenia, the vital power of the heart is in all cases extinguished. For in many such cases, were the heart laid bare directly after what seems to be a fatal result, its fibres would be found excitable by stimuli. Yet as to this point generally, there is at present a want of precise or accurate information. We have no fficient data whereby to determine in what cases the

the contractility of the heart is actually abolished or merely in abeyance.

12. This, I think, comprises nearly all that need be said in regard to the physiology of the death by Syncope. One fact remains which demands special attention. But it holds equally of the death by Asthenia, and I have reserved consideration of it till now. It is this:—that after death the two sides of the Heart are similarly situate in respect of the quantity of blood contained in them. The two ventricles are sometimes found empty of blood; sometimes more or less full of blood; but whether full or empty, there is no difference between them in that respect. And there is no congestion of blood in the lungs. Why this should be will clearly appear when we come to consider what obtains in all the Modes of *Pulmonic* Death, in which there is a widely different state of matters.

13. There are yet one or two points that call for notice. One is a misconception as to the nature of Syncope, or as to the nature of shock as a state of the nervous system. The other is the question whether there is such a form of Syncope as *spasm* of the heart.

14. As to the former of these, it is remarked by the late Dr. Fleming of Birmingham that Aconite may prove fatal—1. By creating a powerfully sedative impression upon the nervous system; 2. By Syncope; and, 3. By Asphyxia. (Scoresby-Jackson's *Note-Book*, 4th Ed. p. 336.) Here is a distinction drawn between a sedative impression on the nervous system and Syncope. It is making the state of shock apart from the

condition of the heart, a mode of death,—or a cause of death. It is not one, as far as I know, recognised by any other writer. But as it is occurs in a favourite book on Materia Medica, I think it right to take notice of it. I have already said in this lecture (§ 10) that apart from the heart, no danger whatever attaches to the state of the nervous system in question,—to the state of shock. It may subsist for hours,—for many hours,—nay for days, and yet be recovered from provided the heart resume its action. It is a cause of death only in as far as it induces Syncope. But if so, why make Syncope *another* mode in which Aconite proves fatal?

15. Next as to *spasm* of the Heart as a form or variety of the death by Syncope. In my first lecture on this department of my subject (Lecture XX. § 16,) I adverted to it. But I reserved consideration of it till now. Is there such a thing as spasm of the Heart? Is there such a mode or way of Dying? Formerly, I referred to the allegation that in cases of poisoning by Digitalis, the fatal event is due to its inducing spasm of that organ. This idea, I may add, seems to be the foundation of the use of that drug as a stimulant or tonic in certain kinds of Heart disease. It is now spoken of by many as a *Cardiac tonic*. Now, the question is,—does Digitalis prove fatal in the way alleged? Does it induce Spasm of the Heart,—and such spasm as by its permanency is necessarily fatal? How stand the facts? It is said by some that it kills in that way. But, as I pointed out in a previous lecture (Lecture XV), two French observers, MM. Feltz et Ritter, who seem to

have made the lethal action of Digitalis a special study, make this confident affirmation : " Dans toutes nos autopsies d'animaux morts par la digitale, nous avons toujours trouvé le cœur en etat de *relachement*, renfermant à peu de chose pres la même quantité de sang dans chaque ventricule. Nous n'avons jamais trouvé le cœur en etat de *contraction tetantique*." (See *Ante*, Lect. XV). Nothing can be more precise than the affirmation here made. And we have it put before us twice, once in a positive, once in a negative way. They say that they have *always* found the heart in a state of *relaxation*, and, also, that they have *never* found it in a state of *tetanic contraction*. As far as these observations go, they are in keeping with the old notion of Digitalis being sedative in its action, not stimulant.

16. But this is not all.—After affirming that in animals killed by Digitalis they have never found the Heart in a state of tetanic contraction, they add " Comme c'est la regle dans les intoxications biliaires " (as is the rule in animals killed by the action of the biliary salts,) " les sels biliaires tauro et glyco-cholates de soude." Here, plainly, we have admission made that there is such a thing as fatal " tetanic contraction," or spasm of the heart.

17. But what, meanwhile, as to the *proof* of this last affirmation of MM. Feltz et Ritter ? namely, that the salts in question prove fatal, as a rule, by inducing " contraction tetanique " of the Heart. It rests simply on their own statement. It comes in *incidentally* in a paper (a " Note ") bearing the title " De l'action de la digitale comparée a celle des sels biliaires sur le pouls, la

tension arterielle, la respiration, et la temperature," in the *Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences.* Vol. 82, (1876.) p. 1343.

18. I have gone more fully into this matter because of its bearing on the larger question,—whether ever Syncope results from *spasm* of the Heart. It is conceivable that this may be one of the ways or forms of Death by Syncope, and that not only sundry poisons, such as Aconite and Strychnia but also sundry diseases, *e.g.* Tetanus and Hydrophobia may prove fatal in that way. There is a popular notion that Death may thus happen. The question is an important one, and seems to deserve more attention than it has yet received at the hands of physiologists and pathologists. Yet let me add, that should it be established as a matter of fact that there is such a way of dying, it would after all be a mere variety or form of Syncope,—attended with sudden suspension of the action of the Heart, with immediate abolilion of the consciousness, and simultaneous arrest of the breathing. And, in contrast with some forms of Syncope which Sir Thomas Watson would say have their real beginning in the Brain, this form of it would in the truest sense have its beginning at the Heart.

19. I must defer till to-morrow the physiology of the two Modes of *Pulmonic Death.*

LECTURE TWENTY-THIRD.

The Physiology of the several Modes of Dying continued. (PULMONIC DEATH). I. *Of that by* **Apnœa**; II. *Of that by* **Coma.**

1. It only remains for us to consider the Physiology of the two Modes in which PULMONIC DEATH occurs, namely, that by *Apnœa* (or Asphyxia),—and that by *Coma.*

2. (I). Of death by APNŒA.—Here we enter on ground in many respects widely different from that we have heretofore occupied. Other and different questions present themselves for solution. We have to look at the dying process as it results from the *direct* occlusion of the atmospheric air from the lungs, the consciousness being in the first instance, or at the outset, entire. What are the facts that call for explanation? Here, indeed, as in *cardiac* death, Life is extinguished by failure of the action of the Heart, for, as we have seen, so long as this organ acts, or is capable of acting, Life subsists. But how in Apnœa does the heart's action fail? Here the heart sustains no shock, as in Syncope. Here its power is not gradually exhausted as in Asthenia. How is it then that it ceases to beat,—that its action is brought to a standstill? The first answer is, that the heart's action fails *because* of the access of air to the lungs being shut off. The proof of this lies in a nutshell. The access of air to the lungs being excluded

(no other disturbing cause operating), the heart shortly ceases to beat:—the air readmitted within a seasonable space, the heart resumes its action. A simple experiment of Bichat's demonstrates this. Adjusting a stopcock to the top of the trachea in a dog, and shutting the cock, he quickly brought the heart's action to a stand. Readmitting the air, the heart quickly resumed its action. (*Researches sur la Vie et la Mort.* p. 222). What is the explanation of this? What the immediate effect of cutting off the access of air to the lungs, and what the effect of readmitting it? It is this:—that in the former case the blood is not *arterialised*, and that in the latter it is again arterialised. It is the *non-arterialisation* of the blood, therefore, that in some way arrests the action of the heart. But how? It is because it arrests the passage of the blood through the lungs. The blood is arrested in its movement through them. It stagnates in the capillaries of these organs. What follows we shall presently have to consider.

3. Meanwhile let me observe, that for a time the non-arterialised (or venous) blood *does* pass through these organs, and through the brain and other organs of the body. The systemic circulation in short, albeit it is one of black blood, is maintained for a time. But it is for a brief space only. In a trice it comes to a stand-still in the lungs; and it does so in such manner that the power of the right ventricle cannot drive it on. The further steps of the process are sufficiently simple. The right ventricle, unable to act because of the block in front of it, becomes quiescent. And no blood being delivered over to the left side of the heart, the left

ventricle becomes quiescent also. This being the case, the action of the heart as a *whole* ceases; and nothing will avail to effect the renewal of its action save the single expedient, if adopted in time, of readmitting the air into the lungs. This effecting the aëration of the blood, effects also its movement in these organs. The right ventricle now resumes its action; and the left ventricle coming to be sufficiently replenished with its proper stimulus, again holds on its way.

4. After death in cases of this kind—(and the like holds necessarily in cases of death by Coma), it is found that the lungs are gorged with blood;—that the whole right side of the heart, the pulmonary artery issuing from it, and the systemic veins leading to it are distended with blood; and that the left side of the heart, the veins passing from it to the lungs, and the aorta arising from it are empty. The immediate seat of the arrest is the capillary vessels of the lungs. And this arrest dams up the whole mass of blood behind them, while it allows the blood in front of them to drain off. This state of matters needs no explanation. But it is important to be familiar with it, because it is characteristic of every form or variety of *Pulmonic* Death. It need only be remarked, that the congestion and distension are greater in proportion as the dying process has been protracted.

5. This I believe to be a true account of the death by Apnœa, and so far a complete account of it. One or two points, however, remain to be considered. One is, —How it is that the non-aëration of the blood should arrest its movement through the lungs,—should cause

it to stagnate in the capillaries of these organs? Into this I do not enter. There can be no doubt as to the fact; but how it is is a question, and a difficult one. The solution of it does not concern us in a practical sense. Let it suffice to state, that Dr. George Johnson, of King's College, London, has recently discussed it in his *Goulstonian Lectures* (1877). Another point is this: The consciousness in these cases quickly comes to be first blunted and then abolished. Is this because of venous blood being transmitted to the brain—as for a short time it is; or is it from the failure of the circulation through that organ? It was long supposed that it is due to the venous blood acting as a *poison* on the brain. No proof, however, was ever advanced that it is such, or in a way so rapid; and the idea now generally entertained about it, I believe, is that it is owing to the rapid failure of the circulation through the brain, as in the Syncope resulting from sudden loss of blood. In truth, if you reflect for a moment on the matter you will see that in Apnœa the failure of the circulation through the brain must be as rapid as it can well be in almost any case of Syncope resulting from hæmorrhage. Moreover, were the brain poisoned by venous blood circulating through its substance, the heart itself must be poisoned from the like cause; and it is difficult to understand how in this case, the artificial respiration (*i.e.*, the aëration of the blood) should avail to enable the poisoned heart to resume its action. It were surely a poor look-out in such cases if we had to deal not only with a block in the lungs, but also with a poisoned heart! Whereas, nothing is more certain than that, in *ordinary* cases of direct Apnœa, the readmission of air into the lungs, if effected at once,—even after the heart has ceased to beat, and must be already fully charged with venous blood, is commonly effectual in restoring animation.

6. There is yet another point connected with the death by Apnœa to which I wish to call your attention. I spoke a little ago of there being a *block* in the lungs. A block there truly is. But in connection with it, I would bespeak your attention to a question in regard to the *right* ventricle of the heart. Why does this ventricle cease to act? The left ventricle we know ceases to act through want of blood. The right ventricle, however, is full of blood, and of its own proper kind of blood, namely, venous. How then does its action come to a stand? It is held by some that it is because of its being *over-distended* with blood, and in a manner *paralysed* thereby just as happens with the urinary bladder in cases of retention of urine.* But the cases are not really parallel. For after the right ventricle has become quiescent in Apnœa, its action may *at once* be restored by the admission of air into the lungs. The arterialisation of the blood suffices for that ventricle again resuming its action. This it could not do if it were in any real sense paralysed. The urinary bladder

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* This, according to Dr. Cleveland, would appear to be Dr. Carpenter's view. In a quotation he makes from Dr. Carpenter, in regard to the state of the heart in this mode of dying, these words occur:—"the right side gets over-distended and paralysed." (*The Modes of Dying*, by W. F. Cleveland, M.D., 1870, page 16).

does not thus speedily regain its power of acting after being emptied by the catheter,—days often elapsing before it does so, and the catheter being required from day to day for a time. But in Apnœa, the restoration of the action of the ventricle is not an affair of days: it is one of *seconds*. Even in the most favourable cases, the time within which its restoration is possible is exceedingly brief,—the affair of a minute or two at the most. Paralysis, therefore, from over-distension cannot be the cause of its quiescence.

7. What is it then? Consider for a moment what there is *in front* of that ventricle. It is the *block* in the lungs already referred to,—the damming up of a vast mass of blood in two immense organs. And on the known principles of mechanics, a tremendous power that block must be. It may be questioned whether a one horse power would avail to overcome it! And yet so simple an expedient as the readmission of air into the lungs will suffice for that comparatively weak ventricle resuming its action, and sending on the blood. We are apt here, I apprehend, to be more or less misled by the revelations of the dead-room. The post-mortem examination in such cases is not made for some hours after death. Meanwhile, or during the interval, certain changes have been going on. For a brief space after death, the mass of blood in the systemic veins has been moving forwards,—leading to a degree of distension of the ventricle such as probably did not exist at the moment of death,—or at any period (after the cessation of its action) within which re-animation was possible. In other words, we probably *then* see more in respect of

the degree of congestion and distension, than existed at the moment when death actually occurred. The block, then, in front of this ventricle is, I cannot but think, the cause of its quiescence without this being in any degree referable to over-distension. But you may ask, why does not this ventricle struggle on to the bitter end,—act and react until such time as it is so distended with blood as to be actually overpowered and paralysed thereby? That it ceases to act before this occurs, appears from observations made immediately after death in animals killed in that way,—and also from the fact already adverted to, namely, that it ceases to act while yet the restoration of its action by the artificial respiration is possible. Why then does it become quiescent? We cannot tell.—Stahl, if he had known this piece of physiology, would no doubt have called in his *Autocrateia.* He would have said that "the rational soul of man which governs the whole economy of the body," knowing how useless the struggle is,—and knowing also that the only chance the ventricle has of again resuming its action, lies in its avoiding the struggle, induces it to make a virtue of necessity and forbear!*—So much for the physiology of the Death by Apnœa.

8. (II). Next as to the Physiology of the *Death by* Coma, or that by *indirect* Apnœa. This need not detain us long. In the death by direct Apnœa, the consciousness, as we have seen, is at the outset entire; and the distress of the unappeasable *besoin de respirer* amounts

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* See Lecture V, § 12).

to an agony the most horrible, until, happily, the consciousness fails. In the mode now before us the reverse is the case. From various causes or in different ways, the consciousness comes to be blunted and then abolished; the patient lapses into a state of stupor which culminates in more or less profound coma, and the *besoin de respirer* is never felt or painfully felt. *Pari passu* with the failing consciousness, the respiratory movements become gradually slower and slower, and less and less air passes into the lungs. At length, the consciousness altogether failing, the respiratory movements entirely cease, and the exclusion of air is complete. What follows is the same as in direct Apnœa.

9. The physiology, therefore, of the death by Coma seems obviously to resolve itself into the physiological conditions of Consciousness. What has now been said as to the *apparent* relations of consciousness to this mode of dying is unquestionable. The facts that are apparent are as has now been represented. But physiologists may affirm that the relations in question are apparent only,—that the varying changes in the consciousness are but *accompaniments* of what really obtains; and that the primary cause of the changes in the respiratory movements, and of their eventual suspension, and therefore of this mode of dying, is referable to some lesion, functional or organic, of *Reflex-action*. They may hold that, although the respiratory movements are subject to the control of the will, as every one knows they are, and although the want of breath may (as in direct Apnœa) be painfully and even agonisingly felt, nevertheless in the natural state the whole process of

breathing is essentially independent of the consciousness, —the latter having nothing further to do with it than as an accompaniment, and to subserve certain important purposes in the animal economy. They may hold that during the waking hours, as during sleep, the respiratory movements go on involuntarily, that is, quite independently of sensations felt and instinctively responded to and prompting the movements in question.

10. Be it so. Granted that these movements are purely reflex in the sense now understood by physiologists, it nevertheless so happens that the physiological conditions in the nervous system, or in the parts of the nervous system, concerned in the respiratory movements, are precisely those that are the more immediate seats of consciousness—of sensation and volition. Dr. Alison, who long refused to give in his adhesion to the Reflex Theory, held quite independently of it, and many years before Marshall Hall mooted the idea of it, that the parts of the nervous system which furnish the physical conditions of consciousness, extend no higher than those assigned to the exercise of Reflex Action,—namely, the Medulla Oblongata.[*] Let me just add as

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[*] From experiments made by various physiologists and duly stated "it appears (Dr. Alison remarks) that if we regard the spinal cord as reaching to the Corpora Quadrigemina, and giving origin to all the nerves, we are to attribute to it, and to the nerves arising from it,—but especially to its highest portion—the medulla oblongata, and the fibres extending thence to the crura cerebri,—all the physical conditions that are necessary, in order that Sensations may be felt, and that Voluntary efforts may excite muscular contraction; the mental stimulus of Volition being just on the same footing, in regard to

to this whole matter, that many of the phenomena of the dying process as occurring in this way, and many points bearing on the successful treatment of it, accord best with the idea of consciousness and sensation having a *substantial* share in it.

11. The only other point demanding consideration is the fact that, although no part of the nervous system higher than the medulla oblongata is concerned, consciously or unconsciously, in the maintenance of the breathing process, it often happens that the *obvious* seat of the lesion causing death by Coma, is much higher up than this, lies in the brain, or on the surface of this organ, as in certain cases of coma from apoplexy, or depression of a piece of the skull. As to this, however, we need have no difficulty. Experiments by Fleurens and others serve to shew, that lesions of the parts in question exert an influence which is transmitted downwards to the medulla,—an influence adequate to the production of coma and the suspension of the respiratory movements. As to the way in which many injuries or diseased states, or poisonous agents induce coma and suspend the breathing,—or on what parts of the

muscular contraction, as a physical stimulus applied to the medulla oblongata."—(*Outlines of Physiology*, 3rd edition, p. 213).

"It will appear afterwards (Dr. Alison subsequently adds), with what intentions, as regards Sensation and Voluntary motion, the brain and cerebellum are super-imposed on the spinal cord. It will appear that they are useful, not in order that Sensations may be felt, but that they may be remembered and availed of for useful purposes; not in order that Volutions may act as stimuli on muscles, but that they may act on them at the right times, and in the requisite variety of combinations and successions." (*Ibid*, p. 214).

nervous system they more immediately act, and how they act, we cannot tell and may never be able to say.

12. What is of interest, and of the highest practical importance is, to ascertain how the influence of these agents and lesions in inducing coma may be most effectually obviated or counteracted. It is here especially that the Artificial Respiration may be turned to account, as well as all the agencies that avail to rouse from stupor, such as flipping or flagellation. And if the cause inducing the coma be but temporary in its action, as for example that of alcohol or of opium on the brain is, we may reasonably hope for success in the use of the artificial respiration, be the stupor never so profound;—or if this be but a degree or two deeper than what obtains in natural sleep,—one or two degrees only below what is compatible with the exercise of Reflex action, now rapidly failing, we may hope that the other expedients named, *e.g.*, flipping or flagellation, will effectually answer the end in view; while without them the patient may go on sleeping deeper and deeper till he sleep the sleep of death. I have myself seen two cases, and have heard of others in which these expedients,—in the one flipping, in the other flagellation, undoubtedly availed to the saving of life.

13. I have now said all that occurs to me in regard to the several Modes of Dying,—the distinctions that obtain among them,—the phenomena that attend and characterise each,—and the physiology or the rationale of each. On some points the statements made may not be on a level with the present advanced state of physio-

logy,—and here and there they may be open to challenge. I would fain hope, however, that they are not lacking in much,—still less in anything that is important.

SUPPLEMENTARY NOTES.

NOTE I.—In § 8 of Lecture XX., I have so expressed myself as to make it appear that affection (disease or injury) of *any* portion of the respiratory nervous system which entails suspension of the respiratory *movements*, and death thereby, comes under the head of Death by Coma. Such was not my intention. It is, in fact, only *such* affection of any portion of it as is preceded and accompanied by loss of consciousness, or by failing consciousness that can be so regarded. For there is one affection of the respiratory nervous system which must be set to the account of direct *Apnœa*. It is section (or pithing) of the spinal cord in the neck above the origin of the phrenic nerve,—which nerve arises from the 2nd and 3rd cervical nerves. In this case, the consciousness is in the first instance entire, and it fails secondarily, as in ordinary cases of Apnœa. But by such section of the cord, the diaphragm and the intercostal muscles are at once paralysed and the acts of inspiration completely suspended,—death following, just as happens when the respiratory movements are arrested by external mechanical pressure, as when one is immersed up to the neck in a mass of earth or sand which has fallen upon him, or, as in a case referred to by Dr. Roget, when a cast of the whole chest is at once taken with soft plaster of Paris,—the setting of which would be rapidly fatal.

NOTE II.—In the account given of *syncope* (Lectures XXI, § 6 and XXII, § 8), there is, on the one hand, a mis-statement, and, on the other, an omission.

At page 232, it is said with reference to "the bursting of an aneurism, or a violent blow on the head, or an overpowering mental emotion," or "a full bloodletting *ad deliquium* from the arm," that, "in such cases, the action of the heart rapidly failing, there is a sudden diminution of the pressure on the brain, and the functions of this organ (the brain) are at once suspended." Passing by, meanwhile, the cases of a blow on the head and of a mental emotion, the very reverse of the statement here made is what holds in respect of sudden hæmorrhage. In this case, it is the rapid loss of blood that alters the pressure on the brain, and in such manner as to cause it to depress or suspend the action of the heart. And this, I apprehend, is the true *rationale* of sudden syncope from sudden loss of blood.—Some authors, if I mistake not, speak of the heart's action failing in such cases from the *want* of its proper stimulus—the blood, and regard this form of Syncope as a variety of *Anæmia*, or rather, as being identical with this. But it is plain that the mere loss of blood—or the quantity lost—affords no adequate explanation of the effect produced. For, often, it is exceedingly small,—infinitely less than what is borne in cases of excessive but gradual hæmorrhage without loss of consciousness—or "suspension of the functions of the brain." It is not the quantity of blood that is lost, but the suddenness with which it is lost that affects the brain. The state of this organ thus rapidly induced is equivalent to a *shock*; and it is this shock that reacts on the heart, depressing or suspending its action—temporarily or fatally, as may happen.

What, now, is the *rationale* of a blow on the head, or of a powerful mental emotion suspending the action of the heart? Is it the heart or the brain that is *primarily affected?* One would think it is the brain. If so, all cases of syncope would be referable to one and the same principle, namely, a shock imparted to the brain, or the nervous system generally—which at once takes effect on the heart.—Possibly, however, in some few cases, as in the Syncope from Lightning, both these great organs may be simultaneously affected.—If what has now been said be true, one will see how well Sir Thomas Watson is borne out in the exception he takes to Bichat's language, when he speaks of Syncope as Death *beginning* at the *Heart*. It has its real beginning in the Brain.

NOTE III. Relative to a *new* use of the term *Apnœa*.

It was not until after this sheet was in type, that I discovered that certain modern physiologists make use of the term *Apnœa* in a sense widely different from that done in these Lectures, and that they make a distinction between the state of Apnœa and that of Asphyxia. In these Lectures the terms in question are used as synonymous, and the states they indicate as one and the same.

In giving the preference to the term Apnœa over that of Asphyxia, I have been guided by the example set by Sir Thomas Watson, Dr. Flint, Dr. Bristowe, and others Sir Thomas Watson who was, I think, the first or one of the first to express his preference for the term Apnœa, remarks as follows:—"It is of much importance to get rid, when we can, of unsuitable names. They are very apt to warp our notions concerning the real nature of the things which they are intended to express. This term *Asphyxia*, though in everybody's mouth, is very inappropriate, if we look to its etymology, to the kind of death which it has come to denote. It signifies, literally, you know, pulselessness, the absence of pulse; and therefore it *might* express any kind of death whatever; or if applied to any particular *mode of dying*, it would seem to belong to that which we have just been considering, namely, death beginning at the heart. And you will presently see that it is *peculiarly* inapplicable to all those cases where death results from the non-arterialisation of the venous-blood. Its current signification has, I am afraid, been too long established by custom, to allow of its being restored to its proper meaning without much confusion. But at any rate, I can and shall avoid its use, and adopt in preference the generic term *Apnœa* (privation of breath) as justly expressive of the mode of death to which the word asphyxia is commonly given by authors. The generic English term is *suffocation*." (*Lectures* &c., Lect. v., 5th edit., 1871, p. 69). Again: Dr. Flint, after referring to the state designated Asphyxia observes that "a more correct term," and one, he adds, "now more frequently used," "is Apnœa, signifying deficiency of breath." (*Prin. and Pract.* 3rd edit., p. 67). And so also Dr. Bristowe. After stating that "the retention of carbonic acid in the blood produces the condition which is commonly known as Asphyxia," he observes, "but is more correctly termed Apnœa." *Theory and Practice of Medicine*, 1st edit., 1878, p. 113.

Warrant enough this (besides the use and wont of many years) for my making use in these Lectures of the word Apnœa in preference to that of Asphyxia.

But, "*nous avons changé tout cela*," say some recent physiologists, as "*Le Médecin malgré lui*" of Molière (M. Sganarelle) said in maintaining that the heart is on the right side of the body and the liver on the left.—Thus, Dr. Burdon Sanderson tells us that "saturation of the hæmoglobin of the blood with oxygen produces Apnœa, *i.e.* cessation of respiration." And he restricts the term Asphyxia to excessive hyperpnœa resulting in insensibility. "Excessive hyperpnœa (he observes) is called *Dyspnœa*," and "when it results in insensibility it is called *Asphyxia*";—both these conditions being due not to excess of carbonic acid but defect of oxygen. (*Syllabus of Lectures on Physiology*, 1875, p. 59). Dr. McKendrick expresses himself to the same effect. "There are three forms (he says) of what may be regarded as abnormal respiration,—namely, Apnœa, Dyspnœa, and Asphyxia." And Apnœa he defines as suspended breathing from the blood being saturated with oxygen,—adding, that on this happening, the "respiratory movements are arrested," while, Asphyxia, he informs us, is the state produced by interruption of the respiratory power so as to lead to the accumulation of carbonic acid in the blood." (*Outlines of Physiology in Relation to Man*, 1878, pp. 401, 402).—Once more, Hermann, taking a like view of these three states, expresses himself in almost identical terms with those already quoted. "The respiratory movements can be totally arrested (Apnœa)" in ways whereby "the blood becomes saturated with oxygen." The term Asphyxia; again, he restricts to any means whereby "the access of oxygen to the blood is prevented altogether, or the quantity entering" the lungs is unduly "diminished." (*Elements of Human Physiology*, translated by Gamgee, 1875, pp. 169, 171).

I am not disposed to enter the lists with physiologists so eminent. I cannot, however, but express my conviction that no reason appears for the distinctions drawn by them in respect of the terms now in view, and expecially as they must have known that another meaning than theirs had for many years been applied to that of Apnœa. They all admit that in Apnœa as in Asphyxia the respiratory movements are arrested—only in different ways. It had long been known that hyper-oxygenation of the blood, as when pure oxygen is breathed for a little time, causes speedy death. But the fatal event was set to the account of *coma* being thereby induced; and it was regarded as one of the forms or varieties of the Death by Coma, the respiratory movements not being *directly* suspended as in suffocation, or as happens when the spinal cord is divided in the neck above the origin of the phrenic nerves, but *indirectly* through the coma, as in cases of poisoning with opium. How does the fact stand? In the suspension of these movements direct or indirect? Be this as it may, in altering the meaning of the word Apnœa, and restricting it (seemingly) to the one case of hyper-oxygenation of the blood, these physiologists have applied it to a purpose of physiological interest only and of no practical utility. For, as Dr. Flint, after stating that "*deficiency* of oxygen is the essential feature of Apnœa," remarks,—"an *excess* of oxygen in the blood is probably never an element of disease." He might have added or of accident or injury either. *Cui bono,* I would ask, the application of a term now and for many years in daily use to indicate a mode of dying of frequent occurrence, and occurring in many different ways, to one single mode of dying never met with in medical practice? With the physiologists referred to, Apnœa means nothing more than "cessation of respiratory effort,"—"respiratory movements arrested,"—"respiratory movements totally arrested;" and for this as resulting from saturation of the blood with oxygen, they might surely have found another term.

As this book may fall into the hands of students or young medical men trained in the modern school of physiology, I am glad that I have had an opportunity, ere it was too late, of calling their attention to the older and (among pathologists) the still subsisting meaning of the word APNŒA,—and also of pointing out to them that even as regards the word *Asphyxia,* Sir Thomas Watson holds that it "is *peculiarly* inapplicable to all those cases where death results from the non-arterialisation of the venous blood,"—the term specially applied by our modern physiologists to the cases in question.

LECTURE TWENTY-FOURTH.

General Summary.—Application of the Facts and Principles set forth in the Lectures foregoing to the science of Applied Therapeutics and the Practice of Medicine.

1. If what I put before you in my *Twelfth* and in my *Eighteenth* and *Nineteenth* Lectures be true,—if in the several ways there pointed out the living organism has the power to rid itself of the diseases to which it is subject, and to obviate the lesions induced by them, and thereby bring about the restoration of Health, it is plain that the powers and the provisions of Art must be so far of a subordinate kind,—far more subordinate than is commonly supposed. To say that the views there presented are calculated to degrade Art,—to give too humble a position to the calling we profess, is to beg the whole question as to the relation subsisting between Nature and Art in the Cure of Disease. The question is—"What is truth"? Our national poet—Burns—has said

> "Facts are chiels that winna ding,
> And downa be disputed."

If the truth be as it is represented in these Lectures, there is no help for it but to accept it. Further, if the truth be as it is there affirmed it is, then, as regards instruction in Therapeutics and the Materia Medica, it is the duty of all teachers to unfold them in accordance therewith, and not leave it to be inferred that the curative powers of Art are other or greater than they really are.

2. But this assumes prior instruction in all that relates to the nature of diseases,—to their innate tendencies, and the curative powers and provisions of the organism. Accordingly in treating of every important article of the Materia Medica in its real or supposed curative relation to any disease,—the inherent proclivities of this to a favourable termination, and the modes in which it is brought about spontaneously, ought always to be considered. In this way alone can a sound estimate of any drug be formed, and error avoided. In speaking of Zinc or Arsenic in relation to chorea, for example,—or of Zinc and Belladonna (Trousseau's favourite remedies) in relation to Hooping-Cough, let the student be fully advised, on the one hand, that these diseases will eventually wear themselves out,—and yet, on the other, as experience shews, that in many cases of both as well the severity of the paroxysms as the duration of the attack, may be materially abated or abridged under the use of the remedies in question. It was long ago stated by Dr. Ebenezer Watson, of Glasgow, that the repeated application of solution of Nitrate of Silver to the summit of the larynx will in many cases greatly abridge the duration of Hooping-Cough. In such cases, while alive to the fact of these two diseases undergoing a spontaneous cure, we may yet fairly credit these remedies with curative powers over them of a direct kind,—albeit we may be unable to explain how they act. Strange it is, however,

if the remedies now in view have the efficacy ascribed to them, that they should not be more generally resorted to than they are, or, as regards Hooping-Cough, that the mortality from it should not now be materially lessened. But this by the way.

3. Were the general plan of instruction now indicated fairly carried out, students would have a more definite idea than they otherwise could of the intrinsic value of every article of the Materia Medica as it is brought under their notice. They would attach a definite idea to the cabalistic word *Cure*. In treating of the therapeutic uses of Calabar Bean, Professor Fraser of Edinburgh, enumerates a no inconsiderable number of affections in which he has found it useful—erysipelas, delirium tremens, febricula, rheumatic fever, tetanus, various neuralgic affections, irritable stomach, &c., (Scoresby-Jackson's *Note-Book*, 4th edit., p. 394). It is obvious, however, that the affections named by Dr. Fraser,—one of them of a very trifling character, are most of them of such a sort as by reason of their own innate tendency to a spontaneous cure, to make it extremely difficult to determine how far or indeed whether the Bean has any real power over them. Yet as to one of these affections, namely, tetanus, it is widely different, and Dr. Fraser speaks very favourably of the trials made with it in that disease. It is so often, indeed so generally fatal, that, having in view the known action of the Bean on the system, we may reasonably credit it with the cure (in a way too quite intelligible) in almost any case in which recovery has followed the use of it,—and all the more confidently if

the symptoms were well-marked, if the drug was resorted to in due time, and if there was good evidence that the patient was brought under the full physiological action of it.

4. As this point is important in relation to the general subject before us, let us follow it out a little further. Dr. Harley states that about one half the cases of tetanus treated with the Bean have recovered, —a result which he does not consider satisfactory. (See Royle's *Materia Medica*, as edited by him, p. 656). For my own part I am disposed to consider 50 per cent. highly satisfactory. Mr. Poland states that, "taking all forms together, the mortality is at the rate of about 88 per cent." (Bristowe's *Theory and Practice of Medicine*, p. 1092). What a difference between 88 and 50 per cent! And seeing, according to Mr. Poland, that although the most rapidly fatal cases are fatal within four or five hours, nearly one half of the total number of fatal cases survive the first five days, there is a sufficient amount of time given for fairly testing the value of this drug. Professor Fraser's estimate of its efficacy is, if I mistake not, far more favourable than Dr. Harley's. And it is not improbable that the results would be all the more satisfactory if the treatment were in all cases conducted with the care and judgment which a disease so terrible, and a remedy so potent demand. For a case of this kind, so treated, requires almost the exclusive and unremitting attention of the medical man in charge. It ought to be borne in mind that the Bean may fail because of its not being pushed far enough, or because of its not being repeated at

proper intervals,—(for the disease after being brought within the power of the drug, may reassert itself from undue delay in the repetition of the dose);—or, peradventure, it may fail from its being administered in undue quantity,—the drug and the disease together co-operating towards a fatal issue.

5. I have referred to the cases now adduced because they are of a kind in which we have most reason, as far as our knowledge yet extends, to expect results of a positive and satisfactory kind from remedial agents,—and in respect of which we may well labour diligently to discover remedies for them,—remedies calculated either to abridge their duration, or actually to cure them,—although we may be unable to explain how they act, and be obliged to look upon them as *specifics*. It would conduce greatly to a lessening of the mortality from hooping-cough, if the normal duration of that disease could be reduced from six weeks to three weeks, or less. The incidental complications of it which so often cause it to prove fatal, would be proportionally avoided. So also, to revert again to tetanus, if four-fifths or three-fourths of all the cases of that disease should recover under the use of the Bean, or of some other drug, a signal triumph it would be for Art. And what if some remedy should yet be discovered for Hydrophobia, or for Cancer, or if our list of antidotes for the several poisons—mineral, vegetable, and animal, should be greatly increased.

6. But as regards the Idiopathic febrile diseases, the acute Inflammations and many others,—to imagine in

face of what has been said as to their own strong inherent tendency to hold their ground while they last and then to terminate favourably of their own accord,—and of the manifold provisions there are in the living body for obviating the structural lesions induced by them, and by which the restoration of Health is spontaneously brought about,—to imagine, I say, that in these cases, which make up, moreover, the far greater number of the diseases we are liable to, it is really in our power to cure them in a *direct* sense, or in the sense the public attach to the word *cure*, were only to deceive ourselves. It is not we,—it is not our drugs, that cure them. It is the organism itself. We may come in aid of Nature in the cure of them. But that is all.—And the sooner you get a firm hold of this idea, and come to be familiar with the Modes and the Processes by which the organism of itself works out the cure of them, the more satisfactory will your progress be in the study of Therapeutics,—and the more precise and accurate your estimate of the powers and the resources of Art.

7. But if in the matter of a positive cure, the office of Art be really but humble,—auxiliary only to Nature, in another direction, that is, within the sphere of the Modes and the Processes of Dying, Art may hold its head high. I need not again repeat what I have so often said under this head,—as to the triumphs of Art and the satisfactions that accrue to us in respect of them. Let me just say how important it is that you should be familiar with the details of the Dying processes,—and, specially, that you should be familiar with

the overt manifestations, and the first beginnings of them as they appear in the countenance, in the intelligence, in the breathing, and in the pulse,—and that you should have a thorough knowledge of the ways and means of meeting them successfully as they arise.

ERRATA.

PAGE 13, § 17.—*For* windwipe, *read* windpipe.
,, 32, § 28.—*For* hæmatemisis, *read* hæmatemesis.
,, 154, § 11.—*For* palludal, *read* paludal.
,, 168, *Foot Note.* *For* la cœur, *read* le cœur, *and for* biliares, *read* biliaires.
,, 204, *Line* 1st. *For* malanosis, *read* melanosis.
3.—*For* out of fear, *read* out of gear.

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